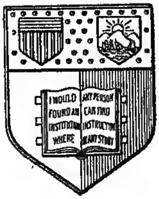
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AGRICULTURAL APPROPRIATION BILL.

SUBCOMMITTEE ON APPROPRIATIONS OF THE
COMMITTEE ON AGRICULTURE,
HOUSE OF REPRESENTATIVES,
Washington, D. C., December 8, 1902.

The subcommittee met at 10 o'clock a. m., Hon J. W. Wadsworth in the chair.

WEATHER BUREAU.

The CHAIRMAN. I have asked Professor Moore to come before us to-day to go over a few matters connected with the estimate for appropriations for the coming fiscal year.

STATEMENT OF WILLIS J. MOORE, CHIEF U. S. WEATHER BUREAU.

The CHAIRMAN. On page 2 we will take up the item of "One assistant chief of Bureau, $3,000." That was the item last year, was it not, Professor?

Mr. MOORE. Yes; that was the item you passed last year, Mr. Chairman.

The CHAIRMAN. It went out on a point of order?

Mr. MOORE. On a point of order. The organic act of the Weather Bureau creates only one office, that of Chief of the Weather Bureau. The act also creates such other officers and employees which Congress may annually appropriate for. Therefore that assistant chiefship was not subject to a point of order. It was in accordance with an existing act of Congress, which provided that just such offices should be created by a subsequent appropriation of Congress.

The CHAIRMAN. I think I told you that if you would have it put on in the Senate, we would stand by it, did I not?

Mr. MOORE. Yes. I think in a word or two I can explain what we have done here. The total Weather Bureau estimate is exactly what it was last year. We have added this one assistant chief and we have cut out one national forecaster and one clerk at $1,000, so that the total expense would be precisely the same.

Representative SCOTT. Does this assistant chief do some of the work that was done by the forecaster or the clerk?

Mr. MOORE. No.

Representative SCOTT. Then were the forecaster and the clerk superfluous before?

Mr. MOORE. If the assistant chiefship be created, the present chief clerk will become assistant chief. He gets $2,250 now. A chief of division will then become chief clerk, and one of the national forecasters will have his status changed from national forecaster to chief of division. Then we dispense with one $1,000 clerk. We reduce our force to that extent. We are doing that for this reason, that there are nearly 200 observatories in the Weather Bureau. There are about 170 in this country in operation every day, and of necessity I must travel more or less. I ought to travel a good deal more than I do. When I am on the road there are national forecasters at Boston, Chicago, San Francisco, and New Orleans who are making forecasts for their districts, and each order they make comes to the central office at Washington and is passed upon by the chief. What I mean is he exercises authority by telegraph. When I leave here there comes in the chief clerk, a man receiving $2,250 annually, who has the authority to step in and supervise the work of the national forecasters, some of whom get $2,500. There is a man in Chicago who gets the latter salary, and he is not overpaid, either. He should not be subordinate to an acting chief of bureau receiving less salary. In regard to a recent great storm, what does the Buffalo Times of December 2 say:

THE WEATHER BUREAU.

It is with a great deal of pleasure we call the attention of the general public to the valuable service rendered the marine interests of the Great Lakes by the weather department of the Government.

Many flattering comments have been written in connection with the able management of the Department of Agriculture by its honorable Secretary, but the work of the Weather Bureau, a branch of that Department, and under the immediate charge of Prof. Willis L. Moore, has demonstrated beyond question that it is an indispensable auxiliary to the mariners of the Great Lakes.

The storm warnings issued this fall by the Bureau have been very accurate, and especially so in regard to the storm that passed over this locality Saturday and Saturday night. The local weather map of Friday contained the following warning to the marine interests: "Light steamers and steam barges with tows should use caution, as high southwest winds will prevail late to-night and Saturday." This, with the storm warning issued Saturday morning, rendered a service that in all probability saved, in this instance alone, to the lake carriers more than the annual appropriation for the maintenance of this Bureau, as very few vessels could have withstood the 66-mile gale of Saturday night, and the work of the Bureau is therefore to be commended.

That is an editorial, and it is not inspired by the Weather Bureau either. It is from the Buffalo Evening Times of Tuesday, December 2, 1902.

Representative COONEY. What did you say that is from?

Mr. MOORE. That is from the Buffalo Times. I just cite that as an instance. Here is another article from the Seattle, Wash., Post Intelligencer in reference to a warning to shipping on Puget Sound:

WINDS BLOW STRONGLY—WEATHER BUREAU GIVES WARNING AND SAVES SHIPPING.

The Weather Bureau yesterday hoisted storm signals at Seattle, Columbia River points, Bellingham Bay, Strait of Juan de Fuca, and Grays Harbor. According to reports reaching the local office early in the morning the center of an approaching storm was in British Columbia, and would result in high southerly winds last night and this morning over the Pacific coast.

The gale set in Sunday night and at times at Seattle the wind reached a velocity of 37 miles an hour. It passed over this section quickly, hastening toward the east. At Spokane it was 20 miles an hour and at Pocatello reached 36 miles an hour. Off the coast it is believed it reached a velocity of at least 40 miles an hour, and any ships that were caught out were probably treated to a rough time.

The warnings of the Weather Bureau were given in time to prevent any damage to shipping on the Sound or in the strait. However, the Sound boats did not arrive with their usual number of passengers, and particularly was this true from Bellingham Bay points. It was not until yesterday morning that the wind abated and there was any moderation.

From 10 o'clock in the morning until late yesterday afternoon the Weather Bureau barometer fell, and at 6 o'clock was lower than it had been at any time Sunday. It was reported at nightfall there was a heavy gale blowing off the strait.

In the Sound the water was rough, and the indications were that before morning there would be another heavy blow.

Yesterday morning there were fears for some of the Mosquito fleet. However, before night all were reported safe in shelter, due to the timely warning of the Bureau.

In the city yesterday and last night the wind was blowing hard. The only damage known of was to the Indian circus tent which was demolished early Monday morning. A gust of wind seemed to pick it up and tear it into atoms. The company sustained a heavy loss by the tearing of their tent in Yokohama.

I could read you a thousand such things.

The CHAIRMAN. It is not necessary, Professor. I think we recognize the good of the service.

Mr. MOORE. I do not want to lose my point. Professor Cox, at Chicago, has a $2,500 salary, and, as I say, he earns it. He is an able man. In that storm, for instance, spoken of in the Buffalo Times he ordered warnings over the upper lake district that kept in the shipping on practically all of the upper lakes. On this particular morning not a vessel left port. When his order came to Washington it was supervised by a man, his junior in rank, who gets less salary than he gets. I do not want to talk too long on this, Mr. Chairman, but I want to make this point clear if I can to the committee. Here is a $2,500 man issuing warnings that have to do with stopping the commerce of the entire upper lake region. He should be a man of discretion and ability. He should not issue warnings of a storm there when there is no storm coming. He may do it once in a while, but it should be done very seldom. He issues his orders every few hours when a storm is passing, and if he goes a little too far it is the duty of the Chief of Bureau to admonish him or to advise him to reach out a little farther in some direction, or that he is going too far in another direction. He gets his orders from the Chief of Bureau.

In my absence some other man must act as chief, and under the law in the absence of an assistant chief the chief clerk must do it. Therefore we have selected for chief clerk a man who is qualified for that office. He is a modest man. He never has said one word about this promotion. He has never asked me for it, and has never said a word to the Secretary about it. I think if the man had not been so modest he would probably have been Chief of Bureau instead of myself. I mean he is not a pushing man; he never pushes himself unduly. I remember an instance of that which I will state. He and I were meteorological clerks together fifteen years ago. A number of the people in that division had war records, and often when they were sitting around waiting for reports to come in they would tell about their experiences in the war. This man had rendered valuable service, but he never said a word about it. Finally there came an order that every man should file his military record, if he had one, and every paper bearing on it. When Mr. Williams's record came in somebody who went up to the chief clerk's office discovered that Williams had enlisted as a private, had been promoted to second lieutenant for gallantry, and finally had been promoted to first lieutenant for having, single handed, arrested one of the worst desperadoes down in Tennessee. He was the only man who had a conspicuous record in the whole party.

The CHAIRMAN. He is getting along in years, then?

Mr. MOORE. No; I think he is 51 or 52 years old.

The CHAIRMAN. He must be older than that.

Mr. MOORE. I say 52. He must be 55.

The CHAIRMAN. I am 56, and I was only 16 when I was in the Army. He must be 60.

Mr. MOORE. I do not know what his age is. He looks younger than you, Mr. Chairman, even if I do prejudice my case by saying so. Mr. Williams would be advanced under that provision to $3,000, and the total expense of running the central office would be no greater.

The CHAIRMAN. It would simply be a little rearrangement of your force.

Mr. MOORE. A little rearrangement of the force; and surely if my duties are important enough to pay me $5,000 to supervise the work of that Bureau——

Representative SCOTT. And you think they are?

Mr. MOORE. And I think they are. I am modest enough to admit that, sir, and $6,000 if you will rate me up with the other scientific bureaus, such as the Geological Survey. I did not intend to go into that, but some of the other scientific bureaus that are smaller than mine get $6,000, and I get $5,000.

Representative SCOTT. I did not intend to have you go into that.

Mr. MOORE. I know you did not.

The CHAIRMAN. We allowed you this assistant chief last year, Professor, and it went out on a point of order in the House.

Mr. MOORE. On a point of order; yes.

The CHAIRMAN. And you claim that the point of order can not hold?

Mr. MOORE. It can not hold against it.

The CHAIRMAN. You do away with a $1,000 clerk, I see, on page 3.

Mr. MOORE. Yes; we are doing our best to curtail what little expense there is created by that additional assistant chiefship, because I say it is justice to the man, and there ought to be a man there of sufficient rank to take charge of the Bureau in my absence.

The CHAIRMAN. I agree with you on that. I think there is need of an assistant chief.

Mr. MOORE. We are on duty every day of the year, every night in the year, and every Sunday.

The CHAIRMAN. The committee understands that the professor asks for five forecast officials, at $2,000 each. He strikes off one. There were six last year. Then he takes out a $1,000 clerk of class 3. In the sixth item on page 3, he asks for 13 clerks, at $1,000 each, which is a decrease of one.

Representative COONEY. Is there not an increase also—"one skilled mechanic, $1,200?"

The CHAIRMAN. Now, we go on down to "three skilled artisans" on page 3. You increase one there, Professor, at $840.

Mr. MOORE. Yes; there is a slight increase there. There is an increase on two mechanics, and I will tell you the reason for it. It is because with the rise in the wage scale during the last few years of carpenters and metal workers we are paying less than the scale of wages demanded by organized labor, and furthermore, those are two mechanics whom it would be almost impossible—one of them especially—to replace. One of them is a skilled metal worker, working on scientific instruments of great precision. Queen & Co., from whom we buy some of our instruments here, pay their men $2,000, I understand. We are paying this man, I think, $1,000, and we want to increase him $200.

The CHAIRMAN. That is a new submittal?

Mr. MOORE. We are cutting out two officers there.

The CHAIRMAN. You are cutting out an $840 man?

Mr. MOORE. A skilled mechanic at $1,200, and a skilled mechanic at $1,000 are added for the purpose of giving promotion to two men of exceptional ability in mechanical work, and who save to the Government each year in the manufacture of instruments and cabinet work many times the amount of their salary. A rearrangement of the office force will make it possible to eliminate one skilled artisan at $840, and one carpenter at $840. You see, we take out these two men at $840 each.

The CHAIRMAN. That is $1,680; and you add what?

Mr. MOORE. A $1,000 man and a $1,200 man.

Representative ALLEN. Do you just substitute these places, or do they go out entirely? Do you substitute one for the other?

Mr. MOORE. Yes.

The CHAIRMAN. It is practically a rearrangement. You employ the same men?

Mr. MOORE. We employ the same men. Of course, we are paying these men less than they could get on the outside—less than the labor organizations give them, according to the new scale they are working under. These are very highly skilled mechanics and surely earn the Government more than some of our $1,200 clerks.

The CHAIRMAN. I figure that makes a decrease of $480.

Mr. MOORE. It makes a slight decrease, I think, on the total salary.

The CHAIRMAN. I mean it is an increase.

Mr. MOORE. Is it an increase or a decrease?

Representative SCOTT. It is an increase, Professor. You put on one $2,000 man and take off two men of $840 each, which makes about $320 increase.

The CHAIRMAN. He increases it $1,200 and as I make it he takes off $1,680.

Representative SCOTT. He puts on $2,000, I think.

Mr. MOORE. Let us take the whole of them. We put on one officer at $3,000. You put on a skilled mechanic at $1,200 and a skilled mechanic at $1,000. That makes $5,200 we have added. Now, what do we take off?

The CHAIRMAN. Just go over that again. The first is $3,000 for the assistant chief.

Mr. MOORE. The assistant chief, $3,000; 1 mechanic, at $1,200; 1 mechanic, at $1,000. That makes $5,200.

Representative COONEY. And you have taken off $4,680?

Mr. MOORE. We take off 1 forecast official, at $2,000; the clerk, at $1,000; then 2 mechanics, at $840. That is $4,680. That leaves $520 increase on salaries.

Representative HENRY. That is your total increase?

Mr. MOORE. Yes; that is the total increase of salaries in Washington. The total for the Bureau is exactly the same as last year, without change.

Representative HENRY. You mean for the expenses of the Bureau, outside of salaries, is the same as last year?

Mr. MOORE. Yes.

Representative SCOTT. The total expenses, including salaries, are the same?

Mr. MOORE. The total appropriation for the Bureau, outside of Washington, is the same as last year. There is this little increase here of $520 and there is a corresponding decrease on the force outside of Washington of that amount, so that the total amount is exactly the same.

The CHAIRMAN. We gave you last year an increase in the messengers and helpers at $480 each—three messengers at $480 each.

Mr. MOORE. They remain the same as last year.

The CHAIRMAN. You find no chance of curtailing them?

Mr. MOORE. Oh, no.

The CHAIRMAN. You keep your figures in that respect just what they were last year?

Mr. MOORE. Yes; just the same as last year.

The CHAIRMAN. You have no chance of cutting them off so as to make your total for salaries just the same as it was last year?

Mr. MOORE. The total for salaries is the same as last year. I have not asked a dollar's increase on the total bill. I have rearranged it a little. The increase is taken off from the other fund.

Representative ALLEN. There is no increase in the expenses?

Mr. MOORE. None in the expenses.

Representative SCOTT. The grand total is the same?

Mr. MOORE. If you will allow me to make a statement there. A man should not extol his own virtues, and I am not doing that, but you have a right to know this record. In 1895 there were only 16,000 daily distributions of the reports of the Bureau. To-day the distribution is 193,000, either by telegraph or by mail, of the reports of the Bureau, reaching the commercial, marine, and agricultural interests of this country. Of course there has been some increase in expense during that time, probably $200,000.

Representative SCOTT. Do you mean 193,000 reports in a year?

Mr. MOORE. A day; 193,000 reports of the Weather Bureau in forecasts, telegraphic or printed, are placed at 193,000 places every morning.

Representative ALLEN. I would like to know if you have made any arrangement with the Post-Office Department toward distributing these weather forecasts in the rural delivery routes.

Mr. MOORE. Yes; I can give you that right here in an instant. I have it in my mind. The Post-Office Department on the 1st of August—we took that as a good day to work from—reached 1,000,000 farmhouses by the free rural service from 10,000 different routes. With the appropriations you gave us we took up that work and, as we always do, tried to do all that we could with what the committee gave us. We have begun the distribution of the daily forecast to the rural service. We furnish now 105,000 farmhouses (and this is included in the statement I just read you) each morning with the daily forecast. They are printed on little slips about 2 by 4 inches. We have a local office where the route starts from that prints the slips, or we may telegraph the forecasts to the postmaster, and he is given a little printing outfit, and he stamps the forecasts on the slips. He stamps as man slips as each carrier has houses on his route. We have gone just as far as it is possible for us to go with our present appropriation in that distribution. If we were to cover the entire million houses each day with the forecast in the morning—and I believe these farmers would make more use of the forecasts than any other people in the country—it would amount to about 300,000,000 a year, a big proposition. We are getting from Representatives right along letters asking that this forecast service be extended to routes in their districts.

The CHAIRMAN. Would that whole expense apply to your Bureau or to the Post-Office Department?

Mr. MOORE. It costs the Post-Office Department nothing, because their men must make the trips, and they are anxious to take these forecasts, because they make the carrier more popular on his route.

The CHAIRMAN. I mean the printing of it.

Mr. MOORE. We do the printing and furnish the paper. The Weather Bureau furnishes all expenses so far.

The CHAIRMAN. Do you do that with the local post-office?

Mr. MOORE. If we have not an observatory in the town from which the route starts, we telegraph the postmaster and furnish him with a little rubber printing outfit in which he sets up the forecasts and does the work of stamping.

Representative HENRY. Using the printed blank furnished by you?

Mr. MOORE. Yes. Take an illustration in New England. There we set up a forecast six or eight times and stereotype it. Then we put that plate, with the six or eight copies, on a press and we run off about 12,000 an hour. In a short time we print the forecasts for the entire New England rural free-delivery service. Then we cut them apart and bunch them up for each man's route. The mails leaving Boston leave so that the forecasts, ready for distribution, reach every carrier before daylight—by the time he is ready to start on his route. That is all done by printing in Boston.

Representative ALLEN. Where you do not print them yourself, you supply to the post office the press and the blank material?

Mr. MOORE. No; we supply to the postmaster a little rubber printing outfit.

Representative ALLEN. And the material?

Mr. MOORE. Yes.

Representative WILLIAMS. You send the slips partially printed?

Mr. MOORE. We send the slips partially printed, and they stamp the forecasts on the slip.

The CHAIRMAN. How have you found postmasters in that regard? Have they been willing to do that extra work?

Mr. MOORE. Yes; they have been willing to cooperate. We get many of our requests from the postmasters themselves.

Representative ALLEN. What do you think of an appropriation to carry out that work?

Mr. MOORE. I have felt that this matter would rather obtrude itself upon the committee, and so it has, for the demand really comes more from our Representatives than from the Bureau. I think it would be a wise appropriation.

Representative WILLIAMS. How much would it take?

Mr. MOORE. If we are to take up this matter at all, it should be taken up and the whole country treated alike. So far we have taken it up in certain sections and tested it, and it has become very popular.

Representative ALLEN. It is in my country, I know.

Mr. MOORE. We are reaching 105,000 farmhouses and we might reach a million. It makes the service extremely popular to the farmer. It would cost $100,000 to handle these million farmhouses every day.

The CHAIRMAN. Outside of the popularity of it, would it be useful?

Mr. MOORE. Unquestionably. It is a matter that depends entirely upon its utility for its popularity.

Representative COONEY. Another thing, Professor. In speaking about the probability of an appropriation of that kind, would now be the time, before you are fully aware that the postmasters throughout the country would cooperate with you in this matter?

Mr. MOORE. The postmasters so far have shown a disposition to cooperate.

The CHAIRMAN. Would it not be absolutely voluntary on their part?

Mr. MOORE. No; the Post-Office orders them.

Representative SCOTT. Let me ask whether this appropriation you speak of contemplates the compensation of the postmaster or does it contemplate all of the work being done by your Bureau?

Mr. MOORE. If we had this appropriation we would make less use of the postmaster. For instance, at Indianapolis, which is a big railroad center, we could put in a rotary press. I have a press now in my mind that I can buy for $600, and it runs out about 20,000 an hour. It is entirely rotary. There is no reverse movement in it. We would mail the forecasts from Indianapolis so as to reach the better part of Indiana and the surrounding regions without troubling the postmasters. It would take money to do that, though.

The CHAIRMAN. You have a report at 8 o'clock in the morning, do you not?

Mr. MOORE. Yes.

The CHAIRMAN. That is when you issue your bulletins?

Mr. MOORE. We get our forecast out at 10 o'clock in the morning.

The CHAIRMAN. If you get it out at 10 o'clock could it go out that day with the rural free delivery, which goes out, as a rule, about 10 or 11 o'clock?

Mr. MOORE. That point I would like to make plain to the committee. If the carriers could always leave between 11 and 12 in the morning instead of at 7 in the morning, we would be able to send out to rural districts the very latest forecast—forecasts based on observations taken all over the country at 8 o'clock in the morning. A portion of the carriers do leave after 10 o'clock and they carry the very latest forecasts.

Representative WILLIAMS. Of course the carriers have to be governed in the time of leaving on their routes by the train times?

Mr. MOORE. Yes.

The CHAIRMAN. If they start at 7 o'clock in the morning you can not send by them any forecast except that of the day preceding?

Mr. MOORE. When the carriers start early in the morning we give them the forecast made up at 8 o'clock the night before, not the forecast made that day. For instance, the forecast at 8 o'clock last night was, "Colder to-day and still colder to-morrow." Now, that would have been carried by these mail routes this morning. They have been exhibiting "Colder to-day and still colder to-morrow;" but if the carrier had had the latest forecast, at 8 o'clock this morning, it would have said, "Cold wave to-morrow morning," because we see by a later observation that the temperature in this region will go down to about 12 degrees by to-morrow morning. They do not get always the latest forecast by the free rural delivery service because of the carriers leaving so early in the morning. Some get the forecast twelve hours old when they start with it.

Representative HENRY. You can not do better than that?

Mr. MOORE. No, sir.

Representative HENRY. The people demand their letters and their mail service.

Mr. MOORE. Yes; and the route must be of sufficient length so that the carrier can start in the morning and get back in the evening.

Representative SCOTT. The very first ones on the routes would get their forecasts twelve or sixteen hours late, while the men who are last on the route would be twenty to twenty-four hours late?

Mr. MOORE. Yes, sir; where the night forecast is used.

The CHAIRMAN. The last would not be reached until 3 or 4 o'clock in the afternoon?

Mr. MOORE. The forecast printed in the morning papers is based on observations made at 8 o'clock the night before.

Representative HENRY. You have the same forecast as the morning paper has?

Mr. MOORE. Yes; for to-day and to-morrow.

Representative HENRY. What I was getting at was, it would do comparatively little good to the farmers who were the last ones reached by the carriers. The carriers go over their routes in the same direction every day, and one man may get his mail at 9 o'clock in the morning and another at 5 o'clock in the afternoon.

Mr. MOORE. Yes; the man profits who gets his mail early, and the man profits who gets his forecast early.

Representative WILLIAMS. This ought to be done everywhere or not at all.

Mr. MOORE. That is true.

Representative WILLIAMS. Down with us every plantation has a telephone station, and when they get the weather report they telephone their subscribers. It costs nothing to telephone, as they do not pay by the message, and they get it all over the county by telephone.

A MEMBER. In my country all the farmers take the daily papers, and this forecast which they would get through the medium of the post-office under your plan is given them in the daily papers.

Representative ALLEN. In some districts I know, notably in mine, the farmers do not get the morning paper until the next day. In my country they take the daily Louisville paper and they do not get it until the next day, so that they are one day behind.

The CHAIRMAN. That would be the case very often.

Representative WILLIAMS. It really ought not to be done at all or it ought to be done everywhere.

Mr. MOORE. You are right about that.

Representative HENRY. What would be the cost of the service?

The CHAIRMAN. He said $60,000.

Mr. MOORE. I said $100,000. It would be $60,000 for the paper alone.

Representative HENRY. Mr. Machen tells me that before the present fiscal year is closed he expects to have 2,000 rural free deliveries. That would mean 2,000,000 deliveries.

Mr. MOORE. That is right. We estimated he would have a million and a half.

Representative SCOTT. You mean 20,000, do you not—20,000 rural delivery routes?

Mr. MOORE. Yes; Mr. Machen expects to reach 20,000 routes. He knows more about his business then I do, but before I knew his opinion I said he would probably reach 15,000.

Representative HENRY. He is going to ask $12,000,000 appropriation for rural free-delivery service this year. Excuse me for interjecting this here, but it comes right along. Five hundred thousand dollars is his deficiency this year. He is going to ask twelve millions for next year and says he shall use it all. That means an expenditure for the Weather Bureau.

Mr. MOORE. To keep up with that, we need at least $100,000. If you start on it you should go through with it. That is all.

Representative HENRY. Just as long as this is a voluntry service these postmasters will volunteer to do it, but just as soon as there is an appropriation made by law they are going to appeal to Congres for compensation.

Mr. MOORE. No; it is not voluntary. The Post-Office Department orders them to do it.

Representative HENRY. But they will say they have this much more to do; that the Post-Office Department has ordered them to do it, and they do not get any extra pay.

The CHAIRMAN. They will ask for an extra clerk in the salaried offices. You take a town that has three routes and that will mean $700 or $800.

Mr. MOORE. They stamp them very rapidly. I have a little stamp that will stamp 1,000 in twenty minutes. They do it very rapidly; they work so fast that you can not see them.

Representative ALLEN. The same as they stamp letters when they receive them?

Mr. MOORE. Yes. The Secretary of Agriculture in his report this year suggests that this distribution be made coextensive with the free rural service.

The CHAIRMAN. The Postmaster-General does, you say?

Mr. MOORE. The Secretary of Agriculture.

The CHAIRMAN. Yes; I know he does. Now, turn over to page 10, gentlemen. You will see the lump sum appropriations for this.

Representative ALLEN. Before we leave that, Mr. Chairman. I understood you to say, Professor, you are supplying how many of these weather forecasts?

Mr. MOORE. One hundred and five thousand daily.

Representative ALLEN. About what is that costing now?

Mr. MOORE. The paper and printing, about $6,000.

Representative ALLEN. To what part of the rural delivery system is that principally extended; where?

Mr. MOORE. New England is the most complete, because they have the best mail facilities from Boston. 'Ohio has a part of it and there is some in Iowa and nearly all other States.

Representative HENRY. Is there any as far as Illinois, Kentucky, Tennessee, and Kansas?

Mr. MOORE. In Indiana they have been striving for a long time, but we have not done much work there yet. I can not tell you now all the districts that receive the forecasts. I can send you a map showing the routes that have been taken up. They were tentative.

Representative ALLEN. Is there any direction or provision anywhere for you to supply these forecasts?

Mr. MOORE. There is no specific authority any more than a general authority that is conveyed by the law which I think gives us plenty of authority for it.

Representative ALLEN. Have you had any other requests except in the New England States for the service?

Mr. MOORE. Oh, yes; we have many requests from different parts of the country. I suppose I have 50 letters from Representatives in Congress.

The CHAIRMAN. It is curious, but I have not had a single letter on that subject.

Mr. MOORE. Then, if they are not interested enough to come to this committee they are not as much interested as I thought they were.

The CHAIRMAN. The post-offices get it the same day it is made, do they not? They get the 8 o'clock warning in every post-office where they have a station at all?

Mr. MOORE. Yes.

Representative WILLIAMS. Formerly the farmers came into town for their mail. Now they do not do that; they receive it by virtue of the rural free delivery, and they do not receive these forecasts.

Mr. MOORE. I find in the distribution of reports many times that anything the people can get for nothing from the Government they will take, and they will imagine they have a great use for it; therefore, we have adopted this rule: Every six months every person receiving anything from the Weather Bureau gets a little slip saying, "Do you desire this report continued?" We always find that some do not answer it, and we then leave them out. If they really want it after six months' trial they will answer that slip. If they do not want it they will simply ignore it.

The CHAIRMAN. Now, let us get along to page 10. That is the lump-sum appropriation; you make no change there. Now, at the bottom of page 11:

For the purchase of sites and the erection of not less than six buildings for use as Weather Bureau observatories.

That was the item given you last year?

Mr. MOORE. Yes, sir.

The CHAIRMAN. You did not use it, did you?

Mr. MOORE. Oh, yes; we did.

Representative SCOTT. You want six more this year, do you?

Mr. MOORE. We want to continue right along on that work.

The CHAIRMAN. What are the sites?

Mr. MOORE. There are many places where there are no Government buildings and no suitable places of habitation for our observers. For instance, under the authority of last year's appropriation we have not completed the building at Modena, Utah, yet.

The CHAIRMAN. There was some difficulty about the site there?

Mr. MOORE. Yes; but we have the difficulty about the site settled, and now we have not been able to get a bidder to erect a building there. I had to send a man there who practically camped out on the prairie; but we must have an observation from that point. It is the most southwesterly point from which we can get a telegraphic report in that great open arid region in Utah. We specially need a barometric observation from there. Then there is Winnemucca, Nev.; Flagstaff, Ariz.; Phoeniz, Ariz.; Nantucket, R. I.; Pocatello, Idaho, and Kalispell, Mont., or Oklahoma, Ind. T., that need buildings.

The CHAIRMAN. Have you nothing at Modena?

Mr. MOORE. We have a station there.

The CHAIRMAN. Have you no buildings there?

Mr. MOORE. We have no buildings there. We would save money by erecting a little observatory. A man would live right in the observatory, and then we would always have him on duty.

The CHAIRMAN. What are the other places?

Mr. MOORE. Yellowstone Park you had in last year, but by the time we got ready to go ahead it was too late to build. When we got our plans ready and got our bids, it was getting pretty near November, and there was no use starting any work there; so instead we used that money to put a station up here in the Blue Ridge Mountains, where it was very important to have a station for this region of country.

The CHAIRMAN. Whereabouts?

Mr. MOORE. About 5 miles from Bluemont, Va., on the mountain.

The CHAIRMAN. Have you not a station in that neighborhood at all?

Mr. MOORE. No; we never have had. In the last few years we have put four stations in the Blue Ridge Mountains, one at Asheville, N. C., one at Wytheville, Va., one at Elkins, W. Va., and one near Bluemont, Va.

The CHAIRMAN. All at the top of the Alleghanies?

Mr. MOORE: Yes; running from here clear down into North Carolina. Before that there were no stations on this broad range of mountains at all, and it was very important for the forecast work of the middle Atlantic coast to have them. We found near Bluemontan 1800-foot elevation and we had to build our own observatory there.

The CHAIRMAN. What is this sixth one?

Mr. MOORE. Kalispell, Mont.—either there or at Oklahoma City. We can rent quarters, of course, in Oklahoma City; but the city is small, and if we put our observatory there now for six or seven thousand dollars we could get a good building which would last us for all time to come. As that city grows, in ten years from now we will be paying probably one-sixth of that in rent per annum; so, in such cities it is best to establish our little observatories early.

Representative SCOTT. I was going to ask whether you could not use the public building at Oklahoma City.

The CHAIRMAN. Have they one there?

Mr. MOORE. I do not know whether they have or not.

Representative SCOTT. It is a town of 18,000 people. They ought to have.

The CHAIRMAN. At the end of that paragraph you have a new provision:

> *Provided*, That if any of the money for these several buildings remains unexpended for the special purposes for which it is appropriated, so much of it as is necessary may be expended for the repair, improvement, and equipment of any other buildings owned by the Government and occupied by the Weather Bureau.

Mr. MOORE. You see, we own 17 buildings now, and if we do not from this building fund provide for keeping them in repair then we must ask for a separate appropriation for that purpose. I will say this, Mr. Chairman: In that appropriation of $50,000 last year and the year before—this is the second time you have given this appropriation of $50,000——

The CHAIRMAN. Yes; I know it is.

Mr. MOORE. In the first one, my recollection is that we turned back into the Treasury $1,700; that is, we completed our buildings, and while we had authority to spend that——

The CHAIRMAN. I think those buildings were specifically named in the bill, were they not?

Mr. MOORE. Yes; specifically named in the bill. We turned back of that appropriation $1,700 because we had completed our work; and while the authority was ample so that we could have gone on and spent that for equipment and almost anything that we wanted around the premises, we put back that which was not needed.

Representative COONEY. This time you regret having done that?

Mr. MOORE. No; I do not. I do not think you can draw that conclusion.

Representative COONEY. Just from the proviso here.

Mr. MOORE. We had the same authority under that bill that we have here. We had the same authority in this way: Under "supplies and equipment" we could have spent all of it. There is no limit to expenses, I mean, if you have that authority in a bill. We tried to expend that money economically and with good judgment. That is the point I wish to make. If you give us money, we will not spend it unless we can make good use of it. If we find that we can save some of it, we put it back into the Treasury.

The CHAIRMAN. On page 12 you have a practically new item:

> For the purchase and construction of a cable and land lines between Block Island and Narragansett Pier, R. I., including labor and all necessary material and

supplies, and for the purchase of sites and the erection of buildings at the terminal places, plans and specifications of the same to be prepared and approved by the Secretary of Agriculture and work done under the supervision of the Chief of the Weather Bureau, including the purchase of instruments, furniture, supplies, flagstaffs, and storm-warning towers to properly equip these stations.

Mr. MOORE. Yes; we have one cable there to-day.

Representative COONEY. What is the distance between Block Island and Narragansett Pier? I want to get an idea of the distance.

Mr. MOORE. I can not give it to you exactly. I think it is about 30 miles.

The CHAIRMAN. What have you there now, Professor?

Mr. MOORE. We have a cable over there, and it is quite an important place. It is an observation station and a storm-warning station.

The CHAIRMAN. What is the matter with the present cable?

Mr. MOORE. The present cable is all right, except that it is a hard coast upon which to maintain a cable. The cable breaks every little while and the whole island is cut off without any communication.

The CHAIRMAN. How many miles across is it?

Mr. MOORE. I do not remember exactly, but my recollection is that it is 30 miles. During the time of the war appropriation was made by some other committee to build a cable over there, and it was built there for the Signal Corps. Last year that cable was turned over to us at the request of Senator Wetmore and Senator Aldrich, so that we might have a second cable. The War Department purposed to sell it at auction. Instead of that it was turned over to us, so that we might have a second cable to keep open communication when the first one is broken. There is often a break. We have never had a year yet when there was not a break some time during the year and communication cut off.

Representative WILLIAMS. Could not that be replaced by wireless telegraphy?

Mr. MOORE. Yes; if wireless telegraphy could be made to work; but I do not know of any place where wireless telegraphy is reliably working. So this cable was turned over to us, and we attempted to put it in repair. We attempted to relay it, but found it was so corroded and rotten that it went to pieces. The people there are petitioning to have constructed a second cable, so that they should not every little while be cut off from communication with the outside world.

The CHAIRMAN. It seems to be a living issue in Rhode Island.

Mr. MOORE. It is a living issue.

Representative SCOTT. If it is a very strong pressure for it, is it not a commercial proposition?

Mr. MOORE. No; wherever there is enough business to keep open the communication the year round we get out of the telegraph business. For instance, over at Marthas Vineyard we recently sold our cable and lines, because I could tell from our receipts that there was enough business to justify private people in going into the business; so we put the cable up at auction and sold it. At the present time there is not much business from the main line to Block Island except for three months in the year; then it is lucrative. There is a good deal of business there during those three months. During the rest of the nine months commercial companies would probably shut up their offices.

Representative SCOTT. You take commercial messages, do you?

Mr. MOORE. Oh, yes.

Representative SCOTT. And handle them at the usual rates?

Mr. MOORE. Yes; we take commercial messages at or a little under the usual rate. We have a conservative rate. We will just about equal the Western Union charges here on the mainland. If a private company owned the only cable to the island they probably would put up a high tariff.

Representative SCOTT. The funds you receive from this toll go into the Treasury?

Mr. MOORE. They go into the Treasury.

Representative HAUGEN. What relation do the expenditures bear to the investment, do you think?

Mr. MOORE. You see, the telegraphic receipts would not maintain the whole Weather Bureau station there, because the Weather Bureau station is maintained not for telegraphic purposes alone. It is maintained for meteorological purposes and storm-warning purposes. The telegraph receipts would not support the station, except possibly at Marthas Vineyard. There the receipts were sufficient, so we put up the line at auction and sold it, under a general policy to go out of business whenever there is enough business to maintain communication.

Representative HAUGEN. Did you reserve the right to send Government messages?

Mr. MOORE. What do you mean by that?

Representative HAUGEN. Free of charge, I mean, in making that sale?

Mr. MOORE. No.

Representative HAUGEN. Then the Government pays for its telegraph service?

Mr. MOORE. I think we pay them a toll of 5 cents a message coming over their part of the line. I think we do. But we own the line from Marthas Vineyard on to Nantucket, and we take business there; and this very same line that we pay for sending our messages from Nantucket to the main line we make pay us for business that we turn over to them that comes from farther out in the ocean, so that the Government does not lose anything on it. This cable to Block Island is one in which the people of New England are very much interested, and if we are to keep open permanent communications we need the cable.

Representative SCOTT. What business do they do on that island, Professor?

Mr. MOORE. Block Island?

Representative SCOTT. Yes.

The CHAIRMAN. It is principally a summer resort.

Mr. MOORE. In summer it is a great summer resort, with boarding houses and hotels.

The CHAIRMAN. That is the chief business, I think.

Mr. MOORE. Yes. In the summer they clamor for communication.

Representative HENRY. They catch the best codfish that are caught on the New England coast.

Representative SCOTT. Where did you spend the $40,000 last year?

Mr. MOORE. We are spending that now for a cable to connect the Farallones with San Francisco. It will be delivered by the 1st of February under the contract we have now made. The building on the Farallones Island, according to a report I have just received, is complete and has been turned over to us by the contractor and accepted by our inspectors; and the cable to connect the Farallones with the Golden Gate will be delivered by February 1. We have let the contract for it.

The CHAIRMAN. You have given up all idea of wireless telegraphy?

Mr. MOORE. Not all idea.

The CHAIRMAN. I mean at that point?

Mr. MOORE. There is no system of wireless telegraphy to-day that has much commercial value, because of certain defects. We still have three men working on a wireless system down on the North Carolina coast.

Representative SCOTT. Senator Burton told me he found a wireless system connecting the islands in Hawaii that had been a commercial proposition and a paying investment for many years.

Mr. MOORE. I fear he is mistaken about it.

Representative SCOTT. He said it had been for years.

Mr. MOORE. I heard that they purchased an outfit and made a payment down, and that it was so unsuccessful that they never completed their payments. I fear the Senator has been misinformed.

Representative SCOTT. He spoke of the matter as if of his personal knowledge.

Representative HENRY. Two years ago you remarked here, Professor, if I recollect aright, that you were already communicating down on the North Carolina coast 400 miles.

Mr. MOORE. Not 400 miles; 50.

Representative HENRY. And hoping to make it 400.

Mr. MOORE. That is right.

Representative HENRY. So as to communicate with vessels out at sea?

Mr. MOORE. Yes.

The CHAIRMAN. You never spoke, to my recollection, with much faith in the thing?

Mr. MOORE. No.

The CHAIRMAN. You were always doubtful about it, but had slight hopes?

Mr. MOORE. I thought we ought to experiment, for this reason: There were very glowing accounts made by representatives of different systems, and the people seemed to believe there were half a dozen systems that could send messages correctly and with a high degree of accuracy. If so, the Weather Bureau could make a wonderful use of it, and it was essential, if that were true, that we devise a system of our own, or at least be abreast of experiments and know what the others were doing. It was with that in view that we took up the work. We have prosecuted a thorough investigation into wireless telegraphy; and while our information has been negative, we have been able to say to our people, I think, that which has saved probably millions to individual investors. We have been able to say to them that in our opinion there was no system of wireless telegraphy that possessed any great commercial value.

The CHAIRMAN. In other words, you have killed stock-jobbing operations?

Mr. MOORE. We have at least retarded stock-jobbing operations. Where we are building this cable over to the Farallones we can put in wireless telegraphy and we can send messages, but we can not send messages as quickly nor as accurately as we can by the cable. We can not keep open continuous communication, because the apparatus gets out of order every little while, and therefore, for every place where permanent communication is desired, the cable is better.

The CHAIRMAN. And more reliable?

Mr. MOORE. It is more reliable. Even if you send messages clear across the ocean, I am of the opinion that the cable will still be the more efficient means of communication.

Representative SCOTT. Do atmospheric conditions have much to do with the successful operation of the work?

Mr. MOORE. Entirely so. At one time last April we thought we had successfully solved the problem of a positive receiver. We made a receiver with which we could send messages for 50 miles just as quickly and accurately as you could send by telegraph. We thought we had solved the whole difficulty. That receiver was predicated upon a little aluminum loop an eighth of an inch long and a thousandth of an inch in diameter. You could not see it, of course. We got our record not by the imperfect break of the coherer that had been in use theretofore, but by the change in the thermal conditions of that little piece of metal as the electric waves ran down the vertical wire into the receiver. It worked very nicely until along about the latter part of May or the first of June. As soon as heat rendered the atmospheric conditions unstable, and the potential between some point in the earth and another in the air changed, that little loop would burn out nearly as fast as we could connect it with the vertical wire. On a day like this our receiver would work very nicely and you might think the whole difficulty had been solved; but in sending communications commercially, you can not wait for the atmosphere to be just right in order to send messages. You must send them every day. That is why I say the cable must still be used.

The CHAIRMAN. Professor, turning back to your salary list, I think you employed 24 messengers there, 3 at $720, 5 at $660, 8 at $600, 3 at $480, and 5 at $450 each?

Mr. MOORE. Yes; you increased it last year 3.

The CHAIRMAN. Are those some of the boy messengers you send around the city here with those cards?

Mr. MOORE. Yes. If we do not employ messengers, we must use clerks.

The CHAIRMAN. On page 12, in your lump-sum appropriation, I see you employ quite a lot of messengers?

Mr. MOORE. That is, outside of Washington?

The CHAIRMAN. No; inside of Washington; in a note there on page 12. Do you need as many messengers as that?

Mr. MOORE. I certainly do; either messengers or some other employees.

The CHAIRMAN. Are they actually messengers?

Mr. MOORE. They are actually messengers or laborers, every one of them.

The CHAIRMAN. Are they colored men mostly, or white men?

Mr. MOORE. They are, I think, about equally divided.

The CHAIRMAN. You have 26 or 27 messengers in there.

Mr. MOORE. I know that, sir. They are all necessary. All those men go into the mailing room when we come to mail our bulletins and reports. We can put on 30 or 40 men simply mailing our reports on certain days, and we have two wagons hauling to the post-office, back and forth.

The CHAIRMAN. I suppose your drivers are classed in those laborers?

Mr. MOORE. Yes; two laborers are drivers, and one man in charge of the stable is a skilled artisan.

The CHAIRMAN. You ought to call him a skilled hostler. How much does he get?

Mr. MOORE. He gets $70 a month. He is a skilled artisan.

The CHAIRMAN. For stable work?

Mr. MOORE. No; he has charge of the horses and wagons. Bear in mind, we run three wagons there.

Representative ALLEN. What do you mean by skilled artisan? Does he do the smithing work necessary to be done?

Mr. MOORE. No; he is skilled in the handling of horses and the care of the stable. I know few places where you need more skill than you do right there.

The CHAIRMAN. How many horses have you?

Mr. MOORE. Five. I use two for my carriages and three for the wagons on the street.

The CHAIRMAN. How many men do you employ in the stable?

Mr. MOORE. Four.

The CHAIRMAN. You have three drivers, do you, or four drivers?

Mr. MOORE. No; we have three drivers.

The CHAIRMAN. Do you employ any men in the stable besides the drivers?

Mr. MOORE. We have four men working in the stable, because often there are two wagons and the carriage out.

The CHAIRMAN. How many men are there in the stable altogether?

Mr. MOORE. I often keep two men busy myself.

The CHAIRMAN. Are there five working in the stable entirely?

Mr. MOORE. There are four, you may say, confined to that stable and to the driving of those horses and those wagons entirely, possibly sometimes five. I often use two men myself during a day and night. My business runs until near midnight, and it runs every Sunday.

Representative ALLEN. Do you alternate them, or use them both at the same time?

Mr. MOORE. If I keep a man out until midnight, that man will not come on duty again until 10 or 11 o'clock in the morning. Then I start another man on duty and keep him on duty until I get through with him.

The CHAIRMAN. Here is a climatologist, at $1,800 a year.

Mr. MOORE. That is Dr. Phillips. He has charge of our library also, and he is our supervising examiner. He prepares all the questions and conducts all the examinations for the weather service. We require a very rigid system of examinations in passing from one grade to another in the Weather Bureau.

The CHAIRMAN. Is he a permanent employee?

Mr. MOORE. Oh, yes; he is a permanent employee.

The CHAIRMAN. Why do you not put him on the salary list?

Mr. MOORE. We can do it. We can cut out all these people and put them in statutory places if you want that.

The CHAIRMAN. Some of them are perhaps in a way temporary and others are permanent. I think the committee would like to have on the statutory roll all the men who are absolutely permanent.

Mr. MOORE. There are no temporary people there. All of them are permanent and have been there for years. You see they are engaged in climatological investigations.

The CHAIRMAN. Yes; I see that.

Representative WILLIAMS. You put them under civil service the minute you put them on the statutory roll.

Mr. MOORE. Yes, sir.

Representative WILLIAMS. I do not see what a driver of a wagon wants to be under the civil service for.

Mr. MOORE. Our drivers are not—I take that back. Every man there is practically under the same as civil-service rules. I can not have a man driving my own carriage unless I draw him off from the eligible list.

The CHAIRMAN. Why should not these people be put on the statutory roll and the amount of their salaries deducted from the lump-sum roll?

Mr. MOORE. There is no reason why they should not, Mr. Chairman.

The CHAIRMAN. I think it is the wish of the committee to reduce that lump sum to the minimum.

Mr. MOORE. If you would allow me, I would take my bill and simplify it and draw it down to one-half of the present phraseology. I could put everything in Washington and a good portion of that outside in the statutory form, and at least all in Washington; but I would have to completely destroy the old bill and rewrite a bill. This is a patchwork.

The CHAIRMAN. It has been added to and added to.

Mr. MOORE. It has been added to and added to. It is like an old roof. It has been patched and repatched until there is nothing of the old roof left.

The CHAIRMAN. Still you have not lately changed the phraseology very much.

Mr. MOORE. No; these were things that were added last year. There is not a thing changed in that, except those two mechanics and the assistant chief, in the way of salaries.

The CHAIRMAN. For instance, on page 12, that list of persons employed under the lump-sum roll. You can take a copy of the bill, if you want to, for your reference; and suppose you give the committee——

Mr. MOORE. You wish me to cut them out of the lump sum and put them in statutory places?

The CHAIRMAN. All you think necessary.

Mr. MOORE. They are all necessary.

The CHAIRMAN. Perhaps some of the laborers and the lower order of employees would not be necessarily permanent. You might keep some of those in the lump sum, but all of your permanent employees from the lump sum of the higher grades you had better put on the statutory roll. You might want to drop out some of the others, or change them.

Mr. MOORE. What is it you say you want me to do?

The CHAIRMAN. Just give us a list of those you think ought to go on the statutory roll as permanent employees.

Mr. MOORE. And then cut that amount out of the lump-sum appropriation?

The CHAIRMAN. Yes.

Mr. MOORE. There is no reason why that should not be done. It would show clearer before the committee each time.

The CHAIRMAN. Oh, yes; a good deal. The lump sum, you know, was started as a temporary thing. The people employed under the lump-sum appropriation were considered temporary employees, but most of them have grown to be permanent employees with the growth of the Department.

Mr. MOORE. Yes. I think the greatest number that we have had in recent years was somewhere from 15 to 18 people in the Weather Bureau outside of the civil service.

Representative COONEY. Let me ask this for information: What is the difference between those on the statutory roll and those who are provided for on page 3?

Mr. MOORE. Those that are statutory are places made by law. The others are places made by the Secretary of Agriculture as he deems the necessities of the service demand. As I say, the employees under the lump-sum appropriation have generally been considered temporary employees to meet certain emergencies, but most of them have grown to be permanent with the growth of the Department.

Representative WILLIAMS. Congress will not know how much is salary and how much is not if it is under a lump sum.

Mr. MOORE. Our salaries outside of Washington, with very slight exceptions, are all in a lump sum. We separate that which we will spend for telegraphing and supplies in one sum. You give us $429,500 for salaries outside of Washington. That roll could be made into statutory places and we would have no objection to its being done, but it would cost the Government, I am satisfied, more money to make them statutory places. If you stop to think, we have no power to appoint anybody there. There is no incentive for us to employ anybody there unless we need them.

We can not dictate or control the appointment of anyone except to take one of three names from the head of the eligible list. We always take them from the top down, unless there is some objection to a man. On that lump-sum roll I think I can show you that we employ the force more economically. We can change the salary at will by my recommendation to the Secretary. I will give you an illustration. Ordinarily the first assistant at Vicksburg, at Charleston, at Little Rock would get $1,200. The men in charge get $1,500 at those places. But two of the assistants only get $1,000 and the other $840. Why? Because, although they are men of ability and have passed our educational tests, they have not been in our service long enough, we believe, to entitle them to get $1,200 a year. With us a man serves on an average over six years before he gets to $100 a month. If the places were statutory, the moment we assign a man as first assistant in one of those places we must give him the $1,200. We exact a great deal from our people under this lump-sum roll for a very small salary, and even though the man has the capacity and the ability and be selected because of his fitness, we still expect that he will give a considerable service to the Government before he receives $100 a month. If these places were statutory we would have to give him promotion the instant we put him in the place.

Representative SCOTT. I think that is a very important point.

Mr. MOORE. I say we have no objection to making those statutory. The other side of that question is this: If the authority the committee gives to the head of the Bureau and to the Secretary to regulate salaries on the lump-sum roll is not used with fair discretion, we can pay any salary we choose. You simply leave it open to us to pay a man anything we want to pay him under that lump-sum roll. We can give him $2,000 as well as $840. You do not put any restrictions on us. But we do not do it, and our salary roll is adjusted fairly and economically for each station. I can show it to you in a minute. I think we get a more economical handling of the money in the lump-sum form for the service outside of Washington than by making the places statutory. For instance, our messengers: We start them at $30 a month. If they do well, we give them $40 a month at the end of two years. We expect them to work for $30 or $40 per month because they have opportunities to study that they could get in few other Government institutions. There are text-books that will teach them along scientific lines, and they may gain final employment in the Weather Bureau as observers if there is energy in them. The official in charge will hear them recite. For the opportunities that the Government gives them we expect them to work for a modest salary. If they are competent to go beyond $40 they can do so. The way is open to them; but the discipline is strict and the competition close, and there are no favorites.

Representative COONEY. That is the proper way, too, I think.

Mr. MOORE. If we make those positions statutory we would probably have to pay at least $50 a month for each messenger.

Representative SCOTT. And pay everybody the same price.

Mr. MOORE. Yes. I say I have no objection to drawing that schedule off and making them statutory places, not a particle; but I think you will get a little better administration if you leave it to our discretion in adjusting the salaries. I wish you would come and look into just what we are paying on the different stations.

The CHAIRMAN. I only had reference to this note on page 12; these are employed in the city of Washington.

Mr. MOORE. There is never any change in that. The same rule does not apply here that applies there.

The CHAIRMAN. I do not care about your putting your laborers and messengers and the cheaper kinds of employees on the statutory roll particularly, but I think those climatologists, and men of that character, had better go on the permanent statutory list if you need them at all times.

Mr. MOORE. Yes; those are permanent employees.

The CHAIRMAN. You say "two assistant foremen of divisions, at $1,600." That is in your printing office, is it?

Mr. MOORE. Yes; one in the pressroom and the other is foreman of the composing room. Then there is a chief of division in charge of that, at $2,000.

The CHAIRMAN. Where is he, on the statutory roll?

Mr. MOORE. No; he is on the printing-office roll. Do you not find him in there? He should be there.

The CHAIRMAN. Two assistant foremen of division, $1,600; 1 lithographer; 3 lithographers; 1 skilled artisan; 1 general mechanic; 9 folders and feeders, and 1 laborer. No; he is not there.

Mr. MOORE. It is an omission, then, because surely he is in there.

The CHAIRMAN. On the lump-sum roll or the statutory roll?

Mr. MOORE. He is in the lump sum. For instance, your appropriation outside of Washington says, "and to include the expense for the maintenance of a printing office in Washington and pay of assistants, printers," and so on.

The CHAIRMAN. That is right.

Mr. MOORE. Then we set aside a certain portion of that sum to maintain our printing establishment, and from that these people are paid here on the printing-office roll in Washington, and the chief of that division, my recollection is, is paid from that lump-sum roll. I do not think he is a statutory man.

The CHAIRMAN. I do not see any such man on the statutory roll.

Mr. MOORE. There are three statutory chiefs of division, and we have four of them there. This man is the fourth one, and he is paid from the lump-sum appropriation for the division he presides over. If he is not in there, it is an omission.

The CHAIRMAN. You can rearrange your statutory roll and put all those men who are permanently employed on your temporary roll into the statutory roll. As I say, I am not particular personally about some of those smaller places, because they are not all permanent really.

Mr. MOORE. For instance, I will give you an illustration in our fuel, lights, and repair. That roll is an elastic roll. Sometimes we have to put on extra force for sometimes only thirty days, when we are doing extra work around there. They are put on and put off, but very little of that occurs. Then it is usually paid from that roll.

The CHAIRMAN. You arrange that, will you, and send it to us?

Mr. MOORE. Yes; I would have done that before, but I thought: If I do that, it will break up the whole sequence of the appropriation bill.

Everybody will think there is a nigger in that woodpile somewhere, and it will be hard to explain it all.

The **Chairman.** No; the committee will simply report to the House that the statutory roll has been increased by transfer from the lump-sum roll and the lump-sum roll reduced accordingly. That is easily explained to the House. We have done it on a good many occasions already.

Mr. **Moore.** I can do that very easily and bring it back to you to-morrow.

The **Chairman.** Just take the high-class men particularly, leaving a few of those messengers and the lower salaried class of people on your lump-sum roll, because they can not all be permanent.

Mr. **Moore.** That will leave a little chance to expand.

The **Chairman.** Conditions may change, so that you do not need them all.

Representative **Cooney.** I am not acquainted with the business of the medical climatologists. What is it?

Mr. **Moore.** It is the study of the relation of climate to disease.

The **Chairman.** Do you think that is well within the sphere of your Bureau?

Mr. **Moore.** Unquestionably; and I will tell you why. I get many letters in regard to the therapeutic conditions of air, and it is one of the most important we know in the curing of disease. So it is highly essential that we should know much about the curative condition of air, and be able to advise people and give correct information against these sanitaria that are all the time springing up and claiming that they have the greatest climate in the world and sending out glowing advertisements in which they make gross misrepresentations. So we have this man and two or three employees who keep track of that work and of the correspondence. My correspondence is considerable on that subject, and I refer it to this man. I need to keep abreast with that kind of work.

Representative **Scott.** What does he do? Does he send out for samples of air to Kansas, for example?

Mr. **Moore.** In the first place, he is a graduate physician, a lecturer in the Georgetown College. He is a very bright man.

The **Chairman.** Does he draw a salary from Georgetown College?

Mr. **Moore.** I think he gets $500 a year for lecturing at night up in the Georgetown College.

Representative **Williams.** I do not understand that. Is that to advise people about the healthfulness of climates?

Mr. **Moore.** It is to advise them; yes, sir. It is to discuss the whole problem of the relation of climate to disease, so far as we know about it. This does not take all his time. This man also takes charge of our library. We have no librarian here, and we have 15,000 publications on climatology and meteorology alone.

The **Chairman.** It is purely a technical library?

Mr. **Moore.** It is purely a technical library. There is nothing else in it. I had it all cleaned out and the surplus sent up to the Capitol or down to the Department, I do not remember which. That man cares for our library. He is a very bright, smart fellow. He conducts all of our examinations for promotion in our service. Officials are compelled to qualify for the different grades and pass an examination on such subjects as we believe they ought to be familiar with. This man conducts all those examinations. He gives about one-quarter of his time, probably, to this climatological work—not over that. The rest is given to conducting examinations and taking charge of the library; but his function in that regard is important.

Representative WILLIAMS. It is not what he is paid, but it is this: If the Weather Bureau is going to take this first step in the arena of medicine there is no telling where it will go. It is like the fellow who did not want any more land except what adjoined his. The more he bought the more adjoined his. There is no telling where it will stop.

Mr. MOORE. No; it has been that way for years.

Representative WILLIAMS. Our sole business is to protect people against changes of climate. We have nothing to do with the other part of it.

Mr. MOORE. Our climatological data enters not only into the study of matters affecting the health of the people but into the commerce and industry of the country, and this is one of the ways of making the data useful. We keep 25 men every day getting up the answers which show the data that is useful. That is one of our great functions, to advise our people and to make this data of the most use to them. We must answer these inquiries. They come from all over the United States. I alone can not answer them. I must have competent assistance in order to answer them.

Representative WILLIAMS. They have no right to ask those questions. It is not within your sphere.

Representative COONEY. How long has this information been continued by the Bureau, Professor?

Mr. MOORE. It was started before I came there. When I first came there they had just begun the publication, under the charge of this man, with quite a large working force, of a book about that size [exhibiting], in which they issued the contemporaneous meteorological conditions that went with increase and decrease in morbidity and mortality. He charted the humidity and the ranges of temperature with morbidity and mortality. He collected these health records from all over the United States wherever they could get them and charted them with the meteorological conditions. That was continued for a year, and I recommended that it be discontinued. We could not make very much out of it. It seemed to me that it appertained to the Marine-Hospital Service, if anybody conducted the investigation, so I recommended to the Secretary that it be discontinued. It was discontinued. We cut out $13,000 in statutory places the next year after this work was discontinued. The only thing that was left was a man or two to answer inquiries along that line.

Representative SCOTT. Do you get inquiries from men in New York, for example, who want to know if their health will be improved by removing to Kansas or Arizona?

Mr. MOORE. No; in order to do that we would have to diagnose each case, and we can not do that without going into the history of each individual.

Representative SCOTT. I want to know something of the inquiries which you say this man answers.

Mr. MOORE. We do not attempt to diagnose for a particular case, but we diagnose for general cases.

Representative WILLIAMS. If a man would write you a letter of this sort, for example, "Is the climate of such and such a place in western Texas good for consumptives?" Would you answer that?

Mr. MOORE. We would answer it favorably.

Representative SCOTT. Do you get any such letters as that? That is what I mean.

Mr. MOORE. Yes; hundreds of them.

Representative WILLIAMS. I think clearly that is none of our business.

Mr. MOORE. But I get the letters and must answer them.

Representative WILLIAMS. No; you say, "Yours of such and such a date received. I am not a medical faculty," and send it back. Any common clerk could do that, you know.

Mr. MOORE. Yes; but a man engaged in manufacturing glue, for instance, writes to us to know what the humidity and the thermal and other conditions are that are most favorable to his business. He gives some of the details of his business and wants to know how we can make our information valuable to him. Shall we answer that we are not manufacturers of glue, or shall we give him the best information we can?

Representative WILLIAMS. I would write back to him: "Our business is to furnish the humidity and the climatological information concerning any place in the world you want to know about, but not to tell you what it is good for after we furnish it." I do not think we have anything to do with a man's glue business at all.

Mr. MOORE. That is for you to determine. Whatever this committee says I will do. If this committee says I am not to answer such inquiries, I will follow its directions.

Representative COONEY. Aside from being librarian, general examiner, etc., and answering these letters, is there any other business that is absolutely necessary in the line of your Bureau for which you should retain this man.

Mr. MOORE. He has attended two of the climatological conventions held in the United States by the medical fraternity. He has gone before them and read papers, indicating how they can continue their studies beneficially, each one to his practice, each one with a general knowledge of climatology as it applies to his medical profession. We do more in advising physicians than advising patients, telling them how they can use this data and apply it to their practice.

Representative WILLIAMS. But this is the point, Professor. Do not misunderstand me. I am not criticising you for having done it.

Mr. MOORE. I understand that.

Representative WILLIAMS. The idea I want to express is this: The science of meteorology, of forecasting, is a big enough job for anyone in the world. It is not even yet a science; and if you can perfect it, and can do the best that knowledge now enables you to do, and discover new methods of doing more, you have all the work the Weather Bureau can possibly attend to, and all we contemplate for it, it seems to me.

Mr. MOORE. That is all right, sir. Whatever limitation the committee wishes to put on it will be acceptable to me.

Representative WILLIAMS. I think that will enable you to do your work much better, because your attention will not be distracted by things on the outside.

Mr. MOORE. That is for you to decide, not for me.

The CHAIRMAN. That gentleman was employed under a lump sum, as a climatologist, and he never came under our observation. That is an example of why we asked for this thing.

Representative WILLIAMS. We can discuss all that later.

The CHAIRMAN. Is he worth his salary, outside of his medical ability, Professor?

Mr. MOORE. That is for you gentlemen to decide. There is nobody around the Bureau who is not worth his salary to-day. If there is a man who is not worth his salary, I should have recommended his dismissal long ago.

Representative WILLIAMS. He is worth his salary as long as he is going to do this work. There is no question about that; but the question here is, What other work outside of this specialty does he do that makes it worth while to keep him?

Representative COONEY. I have no doubt the Professor makes a very valuable man to the Bureau. My chief inquiry is as to what he does in the medical part of his science.

Mr. MOORE. I think, probably, I have misled you a little there. His function it not so much to advise patients as it is to advise physicians how to use our data in their practice. That is a part of his function. I suppose that I might have had a chief examiner, a librarian, a climatologist, and so on, because I believe either one of those functions is nearly enough to employ the time of one man. We work this man pretty hard. We make him perform all three duties.

Representative SCOTT. I will tell you what I think would enlighten the committee more than half an hour of talk. That would be a sample letter of inquiry and a sample reply, giving the medical direction of this man's work, if you could send that to the committee.

Mr. MOORE. What will be better, I will send down the man's entire copy letter book, so that you can see what he is doing.

Representative SCOTT. I confess I have a little curiosity to look it over.

The CHAIRMAN. I think that is all, Professor.

SUBCOMMITTEE OF THE COMMITTEE ON AGRICULTURE,
HOUSE OF REPRESENTATIVES,
Washington, D. C., December 9, 1902—10 o'clock a. m.

The subcommittee met at 10 o'clock a. m., Hon. J. W. Wadsworth in the chair.

BUREAU OF PLANT INDUSTRY.

STATEMENT OF BEVERLY T. GALLOWAY, CHIEF OF THE BUREAU OF PLANT INDUSTRY, DEPARTMENT OF AGRICULTURE.

The CHAIRMAN. Professor, why do you need another clerk of class 4—that high-priced clerk of $1,800?

Mr. GALLOWAY. That is not really a new clerk; that is, it is a new clerk in this respect, $200 is added there to pay another clerk who is getting $1,600, transferred to the statutory roll. This clerk that is put down at $1,800 is now paid $1,600.

The CHAIRMAN. What is the character of his duty?

Mr. GALLOWAY. The clerk has general charge of all the correspondence that comes into the pathological office. She looks after all the requisitions. She is a typewriter and stenographer and general utility clerk, acting as chief clerk of that particular office.

The CHAIRMAN. How long has she been drawing $1,600?

Mr. GALLOWAY. She has been drawing $1,600 one year.

The CHAIRMAN. She was paid formerly under the pathological and physiological investigation?

Mr. GALLOWAY. Yes; and she is paid there now.

Representative WILLIAMS. That ought to be marked $200 increase.

The CHAIRMAN. It is, and transferred from the lump sum, but at a larger figure.

Mr. GALLOWAY. It is an increase of a clerk so far as the list of clerks is concerned.

The CHAIRMAN. On page 14 you will see the note. She is not mentioned in that list there at all. I mean in the little note at the end of the pathological and physiological investigation. I do not see her mentioned in that.

Representative SCOTT. Did you not say she has been taken out of that?

The CHAIRMAN. She is paid from the lump sum now. That is what those notes are for—those who are paid under the lump sum at the end of this fiscal year, not what it is proposed to take out of it.

Mr. WOODS. She has been taken out of the lump sum and transferred to a $1,600 position under the statutory fund at the present time, so that has been taken off.

The CHAIRMAN. It was taken out last year?

Mr. WOODS. It was taken out last year.

The CHAIRMAN. Then it is in the nature of an appropriation?

Mr. GALLOWAY. It is not in the lump sum now, is it?

Mr. WOODS. It is not in the lump sum now.

Mr. GALLOWAY. Then I was mistaken in that, Mr. Chairman.

The CHAIRMAN. She is among those clerks of class 3 on page 5, right below that.

Mr. GALLOWAY. Yes; four clerks of class 3.

The CHAIRMAN. There are four $1,600 clerks there?

Mr. GALLOWAY. Yes; she is one of those.

The CHAIRMAN. You do not reduce that; you simply establish a new office and promote her to the new office?

Mr. WOODS. That is the case, as I understand it.

Representative SCOTT. It is the addition of a new clerk.

The CHAIRMAN. She was not paid out of the lump sum then?

Mr. GALLOWAY. Not this year. That transfer was made last year.

Representative WILLIAMS. This is an increase of a clerk out and out, then?

Mr. GALLOWAY. It is an increase of a clerk.

Representative SCOTT. As well as an increase in salary?

The CHAIRMAN. As appears on the bill, it is an addition of an $1,800 clerk.

Mr. GALLOWAY. Our work is increasing. What we would do in that case in all probability would be to take one of the $1,600 clerks from the statutory roll, as there are quite a number, and transfer him to that position.

The CHAIRMAN. In your Bureau you only have four clerks of class 3?

Mr. GALLOWAY. On the statutory roll in the whole Bureau; yes, sir.

The CHAIRMAN. On your statutory roll, that is, you have only four clerks of class 3; that is, the $1,600 class?

Mr. GALLOWAY. But there are other clerks who are paid $1,600 that are carried on the lump sum.

The CHAIRMAN. I do not notice any of them here. We will take that up when we come to it. That is an increase, Mr. Galloway?

Mr. GALLOWAY. Yes, sir.

The CHAIRMAN. It is for the purpose of promotion?

Mr. GALLOWAY. Yes, sir. On page 15, Mr. Chairman, there are four assistants, at $1,600 each, paid from the lump sum.

The CHAIRMAN. In the note on page 15?

Mr. Galloway. On page 15; yes, sir.

The Chairman. For botanical investigation?

Mr. Galloway. No; that is pomological investigation.

The Chairman. Yes; four assistants, at $1,600.

Mr. Galloway. And one in botany.

The Chairman. Yes; one assistant, at $1,600, in botany. Then you want the four clerks of class 3 on the statutory roll, just as they are now?

Mr. Galloway. Yes; we hold those clerks just as they are now, and this one additional.

The Chairman. Whom do you propose to appoint to that $1,600 place?

Mr. Galloway. This is a lady clerk, Miss Fealy. She has been in the Department now about twelve years.

The Chairman. What does she get now?

Mr. Galloway. One thousand six hundred dollars.

The Chairman. You propose to appoint her to an $1,800 place?

Mr. Galloway. Yes, sir.

The Chairman. How old is she? That is a delicate question to ask and answer, perhaps, but I ask it in reference to her utility.

Mr. Galloway. She is about 35.

The Chairman. Is she a scientific woman?

Mr. Galloway. Partly so. She has trained herself in special work. She came to the Department in a minor position at about $600 or $800 per annum, and for a number of years she was editorial clerk in the Office of Experiment Stations. For several years she was clerk in the office of pathology and physiology; but she is now practically the chief clerk in that office.

The Chairman. You say she is in the pathological division now?

Mr. Galloway. Yes; she is in the office of the pathologist now, assigned there from one of these four positions that are marked on page 5, four clerks, class 3. In all these statutory places we assign them just as they are needed; but we have never made any change in her assignment.

Mr. Woods. She does exactly the same work as the head clerk of the Office of Experiment Stations. She has charge of the correspondence, and all that.

Mr. Galloway. How many letters go through the office a year?

Mr. Woods. Eighteen thousand went through last year.

The Chairman. Head clerk of the experiment stations?

Mr. Woods. She has the same work to do as the head clerk of the Office of Experiment Stations, who gets $1,800, and she is a lady. She is very efficient and worthy, as much so as any clerk in the Department.

The Chairman. The trouble is, gentlemen, it is always leveling up. We can never get leveled down at all. Now, then, ten clerks of class 1. That is an increase of one submitted.

Mr. Galloway. That is an increase of one.

The Chairman. That is on page 6. What is that done for?

Mr. Galloway. That $1,200 clerk is largely to be used in connection with the work of my own office. My office, since the seed work has been put upon it, is very much pressed at times, and I have not had enough assistance. We have to handle from 5,000 to 8,000 letters a week for four or five months, and it keeps four or five clerks pretty busy.

The Chairman. What do you intend to do there? What clerk do you intend to promote? What is he or she drawing now?

Mr. Galloway. So far as I know, there is no promotion in that case. That will probably be an out and out new clerk.

The CHAIRMAN. From the civil service?

Mr. GALLOWAY. From the civil service, if we can not make a change by taking some one who is getting $1,000 and shifting in that way on the statutory positions. We do that usually on the 1st of July; that is, where the Secretary sees fit to make a promotion, upon my recommendation, of a $1,000 clerk, and we can fill that $1,200 position by putting in another clerk, we will do so by moving another clerk up. Otherwise we will have to go to the Civil Service Commission and get a new position. We may get a clerk for $900, though, and move another one or two up. That is our policy, to begin lower down from the civil service.

The CHAIRMAN. You say, "eight clerks, at $1,000 each (increase of two submitted.") That is the following item.

Mr. GALLOWAY. One clerk there will probably be assigned to botanical investigations, although there are a number of clerks carried on the rolls of botany in the lump sum, and we can simply make a transfer, in all probability.

The CHAIRMAN. This is a pretty hard thing to get hold of, for laymen like us.

Mr. GALLOWAY. The question is this, Mr. Chairman: We have a considerable portion of our clerks now over on the statutory side, but we have some that are paid out of lump-sum funds.

The CHAIRMAN. Last year and the year before we transferred a great many people for you from the lump sum to the statutory roll, but according to these notes there seems to be almost as many left on the mp sum as there were.

Mr. GALLOWAY. You will find that the case all through the Department. It is just as Professor Moore said here a while ago. Last year, when these were transferred over, we had considerable difficulty in fitting the people to the places. We had to make exchanges with the Bureau of Forestry and other bureaus, and make transfers and details in order to do that. There was a $1,400 position in the disbursing office, and the disbursing officer did not want the available candidate. We had to change around and give him a $1,400 man, and we took a $1,200 man. We make shifts in that way. That is one of these fixed places. It often makes it necessary to shift a man to a place he really does not deserve, so far as the salary is concerned; but to avoid that, the Secretary makes details. That is done throughout the Department all the time.

The CHAIRMAN. Yes; I know it is. What the committee would like to know definitely, if you can give us the information, is this: What is the need of these three clerks—one in the $1,200 class and two in the $1,000 class? That is an absolute increase, you know. It is not a transfer from your lump sum.

Mr. GALLOWAY. The work increases as the Department is growing; and the general work of each bureau and division is increasing, and it necessarily puts more clerical work on each bureau and division. We have to make each year an increased force. These clerks will simply be used to take the necessary increased work that will come upon us.

The CHAIRMAN. Now, what people are doing the work that you propose to have these three new clerks do? What people are now doing that work?

Mr. GALLOWAY. It would be difficult to answer that specifically, because we are making shifts all the time to take care of this work. For example, in my own office at this particular time of the year I am forced to call upon a number of other branches of the Bureau to help us out in the matter of correspondence. I will get a stenographer for may be a week or ten days to help us over a rush, and we have not help enough to carry on the ordinary work in the ordinary time.

The CHAIRMAN. These appropriations have increased pretty fast, Professor. We have been very liberal all the time. What is all this correspondence now that is complained of? What is it in the nature of?

Mr. GALLOWAY. We have going through our office on an average every day—that is, I am not speaking of the offices of the respective branches, the correspondence of the old divisions, but I mean my own office—we have going through that office two or three hundred letters a day, which come from Members and Senators alone in regard to their various quotas of seeds and various plants they are going to get and things of that nature that must be answered promptly and must be answered frequently at some length. The detail and machinery connected with that work is something enormous. I did not realize it until it was put on us.

The CHAIRMAN. You have an appropriation to cover all that under the seed appropriation. That practically is a division separate from your main office. It is like the Division of Pathology and the Division of Pomology.

Mr. GALLOWAY. We can not get all that out of the seed appropriation.

The CHAIRMAN. Why not?

Mr. GALLOWAY. With the work that has to be carried on, because the amount that is set aside for the purpose in Washington is not sufficient to meet it.

The CHAIRMAN. How much is that?

Mr. GALLOWAY. Forty-three thosand dollars.

The CHAIRMAN. Your expenditures in Washington are limited to $43,000?

Mr. GALLOWAY. Yes, sir.

The CHAIRMAN. All this seed comes by contract, does it not?

Mr. GALLOWAY. No, sir; the only contracting we do is for the purely mechanical work connected with the filling of the packets and the assembling and mailing of the same.

The CHAIRMAN. Filling bags or sacks?

Mr. GALLOWAY. The seeds are bought by the Department. All the correspondence pertaining to the contracts for seeds is carried on by the Department, and all the detail work connected with the counting of the franks is done by the Department. All the correspondence relating to that subject is done by the Department. It requires from fifteen to twenty clerks to count the eight or ten million franks alone.

The CHAIRMAN. Do you buy your seed in the open market—advertise for it?

Mr. GALLOWAY. This year for the first time we bought it in the open market. No; we do not advertise for it. We buy it in the open market without advertising for bids—that is, bids in the ordinary sense of the word. We contract for it, so that we are not always required to take it from the lowest bidder, because that system, as a rule, works harm. The system of doing that work under contract was harmful to the Department, because the tendency of the contractor was to give short weight and do bad work. There is a case pending in the Court of Claims now, brought by one of the men who had that job, and it has given us a lot of trouble.

The CHAIRMAN. If you have this immense correspondence in regard to the seed, why would it not be better for us to increase the appropriation for the seed, the amount available in Washington, say to $50,000, not increasing the lump sum for the seed?

Mr. GALLOWAY. That would be satisfactory. You could do that?

The CHAIRMAN. In other words, let the seed division take care of itself specifically.

Mr. GALLOWAY. Yes. We had a clause in the appropriation bill last year which settled that point, but it was cut out. It was simply to enable the Secretary at proper times to make shifts, but that was cut out, I believe, on the floor, because the point was raised there by Mr. Cannon that if that was done he could not get any seed. That killed it at once.

The CHAIRMAN. It was the point of order that it was new legislation.

Mr. GALLOWAY. The chief point he made was that it would all go to the clerks and he would not get any seed. Of course that settled it.

The CHAIRMAN. I think, Mr. Galloway, it would be a much better way for us to increase the amount in that seed appropriation and let the seed division take care of itself; that is, as near as possible, let that appropriation actually take care of the seed distribution.

Mr. GALLOWAY. That would be satisfactory.

The CHAIRMAN. And answering correspondence from Senators and Members in regard to it is a part of that work.

Representative WILLIAMS. Mr. Chairman, I see it is 12 o'clock. I move that the committee adjourn until to-morrow morning.

The CHAIRMAN. The committee is going to sit this afternoon.

Now, turning to page 14, "Physiological investigations."

Mr. GALLOWAY. We have asked an increase there of $25,000.

The CHAIRMAN. I do not see any objection to that new matter, "For telegraph and telephone service, for express and freight charges."

Mr. GALLOWAY. That is put in there as a general clause.

The CHAIRMAN. That is to cover the Treasury demand.

Mr. GALLOWAY. It is put in there by the disbursing office to cover the necessary expenses.

The CHAIRMAN. How much did we increase you last year from the year before?

Mr. GALLOWAY. From $60,000 to $110,000.

The CHAIRMAN. That is the $50,000 increase we gave you last year?

Mr. GALLOWAY. Yes.

The CHAIRMAN. Do you not think that ought to last you two years?

Mr. GALLOWAY. No, sir; not with the way the work is growing. The question of the study of the diseases of plants and their treatment is one that is growing steadily.

The CHAIRMAN. What have you run across that demands specifically this increase of $25,000?

Mr. GALLOWAY. Mr. Woods is in charge of that branch of the work, Mr. Chairman. I brought him up here particularly because you asked me to.

Representative COONEY. What branch is that?

Mr. GALLOWAY. Pathology and physiology. I thought the committee would like to know just how we are spending the money. Every year we itemize our work; that is, we have the work carried on by laboratories. We assign so much to each laboratory, and then we subdivide the laboratories into problems. We work not so much by laboratories as by problems. We have, therefore, a memorandum which shows what the problems are now and what they will be next year. Mr. Woods can give you that information in detail if you want it in detail.

The CHAIRMAN. We will take up that division of the Bureau.

STATEMENT OF ALBERT F. WOODS, PATHOLOGIST AND PHYSIOLOGIST IN CHARGE OF INVESTIGATIONS, BUREAU OF PLANT INDUSTRY.

The CHAIRMAN. What is your official position, Mr. Woods?

Mr. WOODS. I am pathologist and physiologist in charge of these investigations.

Mr. GALLOWAY. Mr. Woods is also acting chief in the absence of the chief.

The CHAIRMAN. Who is the chief of that division?

Mr. WOODS. We have no chief of division.

The CHAIRMAN. Who had that position before?

Mr. GALLOWAY. I was chief of that division.

The CHAIRMAN. You had that before you were made chief of the Bureau?

Mr. GALLOWAY. Yes. Mr. Woods was the assistant chief. Now he is chief of that particular office, as we call it, and is also assistant chief of the whole Bureau. We have four of these main offices; that is, pathology, botany, pomology, and grass and forage plants. Then the seed work, the Arlington farm work, and those outlying places are all handled through my office. We have no heads or chiefs of these latter branches.

Mr. WOODS. I can go into just as much detail here as you gentlemen want me to.

The CHAIRMAN. We do not want too much detail, but perhaps it will develop along as we ask you some questions. We want to know on what you base your requests for $25,000 additional.

Mr. WOODS. I will give you the lines of work in the different laboratories. Under the pathological laboratory, first, is the general laboratory expense. We spent this year $12,900. That includes the purchase of apparatus and materials of various kinds and of expert assistant pathologists.

The CHAIRMAN. That is paid from the lump sum?

Mr. WOODS. That is paid from the lump sum; yes. The examination of material that is sent in from all over the country—microscopical examination, all the technical work—is done in this laboratory. The estimated increase for that work this year, according to the Secretary's estimate, is $850.

Representative SCOTT. Was that increase made on your recommendation to the Secretary?

Mr. WOODS. My recommendation to the Secretary was to increase that item to $18,000.

The CHAIRMAN. From $12,900?

Mr. WOODS. From $12,900, but he cut it down to $850 increase.

Representative SCOTT. You wanted $5,300 and he gave you $850?

Mr. WOODS. He did not specifically state that $850 should be used for this. The total amount of money I asked for was $263,075.

Mr. GALLOWAY. If I may interrupt Mr. Woods a moment, I will state the general plan in preparing these estimates. Mr. Woods makes his estimate to the chief of bureau. Then after they are all gone over, the Secretary does not go into details at all, but simply goes upon the advice of the chief of bureau, and the general changes are made in consultation with him. The Secretary this year took the ground that he was not going to ask for any material increase along any line, and he insisted that the estimates should be kept down to the lowest point.

The CHAIRMAN. But still they are about $400,000 in excess of last year, and last year we gave you an increase of $625,000.

Mr. GALLOWAY. Yes; that does not fairly more than represent the growth of the Department, Mr. Chairman.

The CHAIRMAN. It depends on how fast you let a thing grow. You can let it outgrow itself.

Mr. GALLOWAY. That is a 10 per cent growth.

The CHAIRMAN. I have heard of that before. I think you people sometimes are carried away by enthusiasm for your work. I do not say that in a critical spirit at all, because I think enthusiasm is a great thing.

Mr. GALLOWAY. Mr. Woods has divided these items in a sort of arbitrary way to decide best just where that $25,000 would go in any particular case.

The CHAIRMAN. The Secretary recommended $25,000 for you to distribute as you pleased.

Mr. WOODS. Yes; I make a horizontal increase in accordance with the statement I handed Mr. Galloway, which the Secretary has and a copy of which I have here in hand.

The CHAIRMAN. Just read the items there.

Mr. WOODS. The first item is "General laboratory expenses;" expended this year, $12,900; estimated increase, $850.

The second is "Sugar-beet diseases;" expended this year, $3,500; estimated increase, $84.

The third is "Texas root rot of cotton and other crops;" $1,000 expended; estimated increase, $542.

The fourth is "Wilt diseases of cotton and other crops;" $2,400 expended this year; estimated increase, $266.

Representative SCOTT. What was the preceding item?

Mr. WOODS. The root rot of cotton.

Representative SCOTT. You spent a thousand dollars this year?

Mr. WOODS. A thousand dollars this year.

Representative SCOTT. And you ask for $1,500 this next year?

Mr. WOODS. The Secretary's estimate is $1,500.

Representative SCOTT. Have you any reason to suspect that it will take 50 per cent more money to handle that particular business next year than this year?

Mr. WOODS. Yes; I have reason to know that we could profitably use $4,000 on that work because I know exactly what work is to be done.

The CHAIRMAN. What work is to be done?

Mr. WOODS. We have to go into the Texas cotton fields and first locate the distribution of that disease, which will cost anywhere from $1,500 to $2,000. Then we have to take the worst areas and send a man in there to collect the resistant varieties in those areas; just as we did in the wilt disease of cotton in the sea-island district. Then we have to take those supposed resistant varieties and make arrangements to have them cultivated in acre patches, in order to determine the actual resistance and select a resistant strain. We have done so much of that work that we can figure it very closely. If we should do that in a thoroughly business like way next year, it would cost us about $4,250.

The CHAIRMAN. What will it cost you next year?

Mr. WOODS. We very likely might finish it up next year or the year after.

The CHAIRMAN. That is one of the things this committee has found, that nothing is ever completed. We never can find anything that is completed.

Mr. WOODS. We have completed a great deal of work. We completed one of our most extensive lines of work last year. I refer to the peach-leaf curl. We are through with that, and we have not even mentioned it in our estimates this year.

Representative COONEY. How did you get through with it?

Mr. WOODS. We have found a remedy which gives us the absolute control of the disease. It is a cheap remedy, and the first year it was put in operation on our experimental area we saved $200,000 to the peach crop of California alone. It has been put in operation now throughout the United States.

Representative COONEY. What is the remedy?

Mr. WOODS. Spraying with Bordeau mixture just before the buds swell. In the first place, we sprayed five or six times in the season. That was rather expensive, and the growers did not feel that they could go to that expense, and it did not sufficiently control the disease, so we sought a cheaper remedy. We found that one spraying before the buds swell entirely prevented this disease. One per cent of it does not appear in the orchard where before there was a complete loss of the crop. We have finished this work.

The CHAIRMAN. What are you going to do this year with the money you used for that?

Mr. WOODS. The money we used for that we are putting in the investigation of citrus diseases in California.

The CHAIRMAN. But you had some money for the investigation of citrus diseases?

Mr. WOODS. We had an exceedingly small amount. Citrus diseases are mentioned in the bill, it is true, but we have not done a thing on citrus diseases for six years until this year. This bill has not been redrawn, for the same reason that the Weather Bureau bill has not been redrawn. We have patched a little bit onto it from time to time.

The CHAIRMAN. It has been changed when sudden emergencies have arisen?

Mr. WOODS. I do not know whether citrus diseases are mentioned in the new bill or not.

Mr. GALLOWAY. Yes; they are.

Mr. WOODS. We wanted money to take up that work whenever we have money available for it.

The next proposition is cranberry diseases. We spent this year $210. We have had the cranberry growers and the New Jersey State station and several other States around here for the last three years after us to take up that disease, but we have no money available for it.

The CHAIRMAN. You do not need a specific appropriation for any specific disease. This covers every disease possible with plants.

Mr. WOODS. That is true; if we can finish up anything and get it out of the road, we will take up the cranberry work without any further mention, but so far it is not among the items we have been especially working on.

The CHAIRMAN. It is one of the items about which you had complaint from the growers?

Mr. WOODS. Exactly; but I can not stop the work on sugar-beet diseases, for example, and put the money on cranberry work. I haven't finished the beet work. I can not stop the work on Texas root rot, because the Texas growers would complain.

The CHAIRMAN. What others are you investigating at the present moment?

Mr. WOODS. The orchard-fruit investigation; that includes little peach, peach rot, and a number of diseases.

The CHAIRMAN. Have you not the little-peach business finished yet?

Mr. WOODS. We have part of it finished, but this year we want to go into the field and demonstrate to the growers how to clean this disease out of their orchards. We have made arrangements for that.

The CHAIRMAN. Will that end that thing up?

Mr. WOODS. That will probably end it all up.

The CHAIRMAN. Is that all the work you have to do on the little-peach line?

Mr. WOODS. So far as I can see now.

The CHAIRMAN. That is, to send experts to show the growers how to clean this disease out of their orchards?

Mr. WOODS. To show the growers how to clean their orchards we have simply to go into the orchards and point out the trees and get the fruit men trained, so they will understand it.

The CHAIRMAN. Are not the experimental stations of the several States doing anything of that sort? Are they supplementing your work?

Mr. WOODS. They are all working along this same line. As a rule we do not overlap on problems of this kind, because we are in cooperation with practically all experimental stations. The Michigan State board of horticulture is cooperating with us in the little-peach investigation.

Mr. GALLOWAY. This particular work in Michigan is to be a demonstration of the proper treatment, which requires considerable work.

Mr. WOODS. It requires expert advice on our part and traveling expenses. We have asked only for a very small amount of money for that work this year.

The CHAIRMAN. Go on with your list.

Mr. WOODS. After we take up these technical investigations we find that in the plant-breeding laboratory and in the plant-breeding line we can secure varieties resistant to disease. Under the head of plant-breeding work, we are taking up cotton breeding, and in that we are getting long staple upland cotton resistant to disease as well as resistant sea-island cottons. We used $7,457 in that work this year, and the estimated increase is $732. In the hardy-orange work, where we are endeavoring to secure oranges which are resistant to frost, and where we have succeeded in getting orange hybrids of good quality that will grow up in South Carolina resistant to weather as cold as this (10° below freezing) in only four years' experiments on them——

The CHAIRMAN. Does that come under your pathological work?

Mr. WOODS. This is physiology. We used $1,005, and according to the Secretary's estimate $460 more will go into that work this year, but we actually could use $3,770.

The CHAIRMAN. Now, do you think there is an important demand for this in the country?

Mr. WOODS. There is a demand for this work in the orange sections; yes. The orange industry of Florida will disappear if they can not get some hardy orange.

The CHAIRMAN. On the other hand, oranges are so cheap that they claim a great deal of the California crop was thrown away last year. That is coming now to a business proposition.

Mr. WOODS. Yes.

The CHAIRMAN. We would like to know whether you could not drop them and take up something more pressing?

Mr. WOODS. We can not drop it without losing all the work we have done; and of course the orange growers in Florida do not want to give up their business simply because the California people have more oranges than they can market profitably.

The CHAIRMAN. It is a matter of business with them. If they can not compete, they will have to give up.

Mr. WOODS. I was in California this year and I did not find anybody complaining of having too many oranges. In the Riverside district, which is the main orange district of California, they have the same trouble that the growers have in Florida. They have to go to great expense to prevent injury to their orchards by frost. They have to put up electric signals. They build big bonfires and spray water and everything else to prevent frost injury, and they are as anxious to get a frost-resisting variety as are the Florida people.

The CHAIRMAN. As I said to the professor last year in reference to all these diseases and blights and difficulties, fruit in this country is no longer a luxury. It is a cheap food product.

Mr. WOODS. We have begun to ship it to Europe in rapidly increasing quantities.

The CHAIRMAN. That depends, of course, entirely upon whether we can export the fruit in proper shape to meet the demands.

Mr. WOODS. That comes under another branch, but our Bureau has been very successful in that regard.

Representative HENRY. What do I understand you to say is the disease you are attempting to resist?

Mr. WOODS. It is not a disease. We are simply trying to produce a frost resisting variety.

Representative HENRY. That applies to northern Florida, I understand. That demand comes from northern Florida?

Mr. WOODS. It comes from northern Florida and California.

Representative HENRY. Part of it?

Mr. WOODS. Part of it; yes.

Representative HENRY. In other words, they are extending the orange industry in an area where it is not altogether a safe crop?

Mr. WOODS. It is not altogether a safe crop, and still it is their principal crop.

Mr. GALLOWAY. Mr. Chairman, there is one point that ought to be interjected here, and that is in reference to the element of chance in this matter. Every individual who hears about this thinks he is going to be the lucky man if he makes a success. Many of them are able to succeed where the mass of the people fail. That is, the men who are successful, as a general proposition, admit that more fruit is growing and fruit is becoming cheaper, but that is not due to the fact that everybody is growing fruit successfully, but more individuals are making money out of it than used to be the case.

Mr. WOODS. If we should cut off this hardy-orange work, I think there will be a good deal of criticism.

The CHAIRMAN. I do not suggest to you to cut it out, but I say something more important might go on.

Mr. GALLOWAY. If we should succeed in securing a frost-resisting orange in all probability that orange can be planted as far north as South Carolina and can be used in the manufacture of marmalade. It would open up a new industry for the South.

Representative HENRY. What is the quality of that orange?

Mr. Woods. What we have already secured is not an orange; it is nearer a lemon.

The Chairman. Then it will not take the place of the orange?

Mr. Woods. The hybrid we now have will not take the place of the orange, but from the seeds of this hybrid we will get our hardy orange. We did not expect any variation until the second generation.

The Chairman. Do you think it will be hardy enough to breed along right on that line?

Mr. Woods. We expect so.

The Chairman. Will it not deteriorate and go back?

Mr. Woods. No; it will not deteriorate. We can fix that. The laws of deterioration in hybrids are so well known now that in many cases we can pick out those that will deteriorate and those that will not, so that we do not go to the expense of testing all of them for several years. We can tell by the nature of the variation whether a hybrid will go right along and reproduce true from seed, or whether it will vary and produce all of the types.

The Chairman. What is the increase you ask for that?

Mr. Woods. We expended on hardy-orange work this year $1,005, and, according to the Secretary's estimate, there will be $460 increase.

The Chairman. Pretty nearly 50 per cent?

Mr. Woods. Very nearly 50 per cent; yes.

The Chairman. Why do you want such a big increase?

Mr. Woods. I really want $3,770 to do the work we should do this year. We have 300 different crosses. We have to take those buds and bud them into oranges in the frost districts, and it costs us something to do that and keep track of them. It is simply the expense of getting that work done and getting the oranges properly cared for.

The Chairman. You have your scientific men who are doing that work, paid under the statutory roll, and this is for traveling expenses?

Mr. Woods. This is for traveling expenses. This is for the orange growers and horticulturists. They will not do it for nothing.

The Chairman. Are you doing any of that work at the Florida Experiment Station?

Mr. Woods. We are doing some at the Florida Experiment Station and some at the Alabama station.

The Chairman. You do not have to pay those people, do you?

Mr. Woods. We do not pay them anything; no. They are glad to go into it as a pure matter of interest.

Under the head of "Improved varieties of pineapple" we expended this year $300. The pineapple industry of Florida is an important one. We have three or four hundred new hybrids. What they want down there is a fine quality pineapple, which can be shipped north. The finest pineapples can not be shipped. They decay in transit. We are trying to get a cross between those which can be shipped and the fine-quality ones. We have those crosses now, and all we want is sufficient to propagate and distribute them, then we will be through with this work.

The Chairman. How much is that?

Mr. Woods. Thirty three dollars increase.

The next is "Indian corn improvement." We spent this year $3,432. We have asked, according to the Secretary's estimate, $817. We could make good use of $8,335.

The Chairman. That is an interesting thing. What improvements do you try to make in that?

Mr. Woods. The greatest point in indian-corn growing is to increase the nitrogen content and to increase the oil content. The use of corn for oil purposes is very rapidly increasing in this country, and corn oil is going to be a very important product. Ordinary indian corn is so variable in its oil content that oil manufacturers do not know whether to buy a farmer's corn or not. They can not buy by variety. They simply have to take their chances.

The CHAIRMAN. How successful have you been in increasing those contents?

Mr. WOODS. We find that both the oil and protein can be increased considerably. We find the protein contents can be increased, making of corn almost as good a food product as wheat.

The CHAIRMAN. You mean you can increase the oil and fat in the same corn?

Mr. WOODS. In the same corn.

Mr. GALLOWAY. It has been increased from a per cent of 1.22 to 2.22, in one year's selection.

Mr. WOODS. Just by selection. It is remarkable the variation there is in corn. You can find it in almost any kind of corn.

Representative HENRY. Can you fix that so that the farmer in growing corn will maintain that standard?

Mr. WOODS. Yes.

The CHAIRMAN. Is that by using the seed from either end of the cob in an ear? I know that there is a theory among farmers that you must not take the seed from the little end of the ear.

Mr. WOODS. That is entirely correct. We have tried that. We always shell off both ends of the ear.

The CHAIRMAN. And take the center?

Mr. WOOD And take the center.

Mr. GALLOWAY. It is found that the nitrogen and protein content will vary in the grains from the same ear, and a simple method has been devised for determining when a particular grain has a large nitrogen content by the specific gravity, and then that grain is planted without having to destroy the germs by chemical analysis to determine the nitrogen content. That is the great point—to find some practical means of enabling the farmer himself to determine whether he has a grain that is rich in this particular food. Since this work has started, however, a number of organizations have been formed for the purpose of breeding seed for this particular purpose; but that is only just started. Demonstration experiments will have to be carried on in different States to show the possibilities in that direction before the work can be extended. But a corn operators' association has been established in Illinois, and their object is to breed corn and sell corn on the ear of a high protein content, or they will furnish seed that will give a high oil content, for the use of the manufacturers of oil there in the large markets of Chicago.

Representative SCOTT. What is the corn oil used for?

Mr. GALLOWAY. It is used in adulterating other oils and for various other purposes.

The CHAIRMAN. Why should that cost so much, Mr. Woods?

Mr. WOODS. It is simply going out and selecting the patches that we want to work in. As a rule we use acre patches and isolate them. We have to rent an acre of land and hire a man to cultivate the corn, and then our expert assistant in charge of it has to go around to the different patches and see that the selections are properly made.

The CHAIRMAN. You mean in different parts of the country?

Mr. WOODS. In different parts of the country; all through the corn belt.

The CHAIRMAN. Is not that a part of experimental station work in the State?

Mr. WOODS. We are cooperating with a great many stations in this. We do not undertake to work where the stations are pushing it as they are in Illinois and Missouri, except where we can help them by cooperating.

The CHAIRMAN. I expect those experimental stations in the great corn belt would take up that very earnestly.

Mr. WOODS. I addressed a letter a few weeks ago to the director of every experiment station in regard to this work, and in many cases they have agreed to go into it, so our expense in the matter will be a good deal lessened.

The CHAIRMAN. You know if they do not agree to go into it the Secretary can compel them to go into it under the law.

Mr. GALLOWAY. There are many things about experiment station work that you, Mr. Chairman, are familiar with that perhaps many members of the committee are not familiar with. The experiment stations dodge these issues. They use the money for other purposes.

The CHAIRMAN. That is true. I do not suppose over two-thirds of them are efficient.

Mr. GALLOWAY. They use it for educational purposes, where they ought to devote it to experimentation.

Mr. WOODS. Some of the replies I got were unfavorable. They said they were using their money in other ways, and that they could not go into it. We find in some cases that if we pay the experimental expenses at the station it costs nearly three times as much as if we go out and hire a farmer to do the work. The only way in some cases is to pay one of their men a salary, and we can not get as much work that way, so we prefer to do the work, except at the stations that have men competent to do the work, as they have in Illinois and Missouri and some of the other States in the corn belt, especially in the center of it.

Representative HAUGEN. Is our station cooperating?

Mr. WOODS. Your station is cooperating and doing very nicely, too.

The next is the alkali crop work. There are some crops resistant to alkali which will grow in the alkali areas without the expense of excessive drainage and things of that kind. We are securing crops which will do that. We spent $3,796 this year, and we have asked for $555 increase.

Next are some new problems that we proposed, for which we spent nothing this year: The question of oat breeding, securing oats resistant to smut, which destroys annually from about 15 to 28 per cent of the crop. We can secure oats resistant to smut, if we can take the matter up. We asked for $2,250 to undertake that work in cooperation with some of the stations and in some of our own areas, but according to the Secretary's estimate the assignment is $375 for that, $416 for tobacco breeding, and $298 for potato breeding—to get potatoes resistant to potato rot.

I will just explain that I did not know what the increase was for this office until Saturday, so that I have not been able to shift these things around just exactly as I will do later. Those problems we will not take up this year on the basis of the present estimates. It will not pay to take them up on that small amount of money.

Under the miscellaneous problems that come up, apparatus and general supplies for this plant-breeding work, we expended $2,330 this year, and we estimate $278 increase according to this horizontal increase.

The CHAIRMAN. Have no experiments been made in potatoes resistant to potato rot and oats resistant to smut before? Those are old diseases with us.

Mr. WOODS. They are old diseases, and we have experimented a great deal on methods of treating them with fungicides. We can prevent oat smut by treating it with hot water or formalin, but it is rather an expensive method. If we can secure a variety of oats that is resistant, if the farmer can go out and sow oats and feel he is not going to get any smut, it will be that much more valuable.

Representative HENRY. Where did the suggestion come from in regard to breeding the type of tobacco mentioned there?

Mr. WOODS. That suggestion, I think, came from suggestions that Professor Whitney made to us in regard to securing some new types and fixing the present types. We are cooperating with the Bureau of Soils in this work.

Representative HENRY. There is great difficulty now with growers of shade-grown tobacco. I think I was in every shade-grown tent, or nearly every one, in the Connecticut Valley. They brought the seed from the island. It has been grown in Florida, and they brought it direct. You go into a tent and you will see half a dozen types of leaves; and they are puzzled to know which type of leaf is the one they want to propagate.

Mr. WOODS. Those varieties of tobacco which make the fine Cuban and Habana and Sumatra leaves are probably hybrid, and they are probably not fixed.

Representative HENRY. The tobacco seed has been brought directly from the island of Sumatra, imported, yet the type varies, and Professor Whitney, when he was in Connecticut in August, was very much troubled and embarrassed. He said he was unable to recognize the type. He could not do it.

Mr. WOODS. That is the origin of this work. He requested us to take it up some time ago.

Mr. GALLOWAY. There is just one point I want to make in connection with that. We are going to use part of the money for seeds for this question of types. Instead of sending out the miscellaneous seeds we have sent out in the past, we are trying to establish types. We will do that with tobacco. We will not distribute miscellaneous types of tobaccos, but we will send out specific types.

The CHAIRMAN. You have increased that from twenty to thirty, I see.

Mr. GALLOWAY. Yes; we will eventually be able to use the whole of this appropriation for that kind of work. We are putting that additional money into this work on types. We are trying to get one of the best authorities in the country to aid in this work.

Representative HENRY. You sent me a limited quantity of imported seed last year that I sent around among growers with the request that they should use it, not generally, but experiment with it. Now, that type was very far from being satisfactory from our standpoint.

Mr. GALLOWAY. That shows the necessity of endeavoring to fix a type.

Mr. SPILLMAN. May I be permitted a word in that connection, Mr. Galloway?

Mr. GALLOWAY. Certainly.

Mr. SPILLMAN. In regard to the various types that appear in that tobacco, we have recently discovered the reason of that and have discovered how to prevent it, so that with two or three years' work with any variety we can stop that thing, unless it happens to turn out that the most valuable type of all is the hybrid type. We know positively now that if that is the case we can not stop that variation, but we must keep selecting that hybrid and keep expecting a certain percentage of variation every year.

The CHAIRMAN. What is that solution they are sprinkling mustard with growing in peas?

Mr. SPILLMAN. It is bluestone.

The CHAIRMAN. Who discovered that—you people here?

Mr. WOODS. That was discovered by the North Dakota or South Dakota station, I believe. It was not discovered. It was known a long time, but the North Dakota station, I think, did the first good demonstrating work.

The CHAIRMAN. Right in my neighborhood we have two very large pea-canning factories, and one of the nastiest things they had to deal with was a tremendous growth of mustard in the soil. That solution was an absolute cure. It kills the mustard and does not hurt the peas at all.

Mr. WOODS. A great many weeds can be cleaned out with copper sulphate. Weeds are often more sensitive to copper sulphate than some crops.

Now, under the next heading we have cereal investigation, including work on cereal diseases, improvement of cereals, adaptation work, etc. We send our experts to collect the various varieties. The seed fund brings them in here. Then this fund under my charge takes them and studies their probable distribution in this country; has them tested in cooperation with the stations and with farmers; makes notes on them in regard to those that show the most valuable characteristics, and then we secure enough seed by contract with practical growers to distribute. If it proves to be very valuable without any selection, then the seed and plant introduction money brings in more seed and distributes it, but we study the adaptation of the crops to this country. The macaroni-wheat work, which another year's work will finally demonstrate, is one of the things we have established in this country. The macaroni work is now very nearly completed. The seed which was originally brought in on the seed-introduction money is distributed throughout the area adapted to the production of macaroni, which is 100 miles west of the bread-wheat producing area.

The CHAIRMAN. That is in the arid regions?

Mr. WOODS. In the semi-arid regions. Ten inches of water is all this wheat needs. It grows without irrigation where there is a 10-inch rainfall. Ordinary wheat requires from 15 to 20 inches of water per year.

Mr. GALLOWAY. About a million and a half or two million bushels have been produced this year.

The CHAIRMAN. Does it bring an extra price in the market?

Mr. GALLOWAY. No; it does not bring an extra price, but it fits into a niche out there where they have not been able to grow anything.

Mr. WOODS. It gives more per acre, and it establishes the macaroni industry in this country.

Mr. GALLOWAY. The most of the macaroni we have in this country is made out of American bread wheat and is soft and worthless; but the macaroni made out of these test plants is an entirely different product. It has a nutty flavor and is palatable. Bread wheat is good to make bread, but not to make macaroni.

Representative SCOTT. Will this macaroni wheat make good bread?

Mr. WOODS. Macaroni wheat makes a very fine quality of bread. It is not a pure starch bread; it has more protein in it, but it is a very fine bread. We are carrying on some of this work in cooperation with the North and South Dakota stations. The South Dakota people reported the other day that their bread made of this macaroni wheat went right alongside of their regular wheat bread.

Representative SCOTT. Is it as white?

Mr. WOODS. It is almost as white if not as white. It is not as white as a very starchy flour, though.

Then we have, under this cooperative work, the increasing of the area of the winter-wheat belt. The winter-wheat belt at the present time is restricted, but we have now in our possession winter wheats which we can distribute this year and next year, which will carry the winter-wheat belt all over the State of Nebraska east of the hundredth meridian, all across Iowa, and higher north than it has ever gone before.

Representative COONEY. Then wheat, I suppose, will be 25 cents a bushel?

Mr. WOODS. No; the world's production of wheat is below the demand and is getting farther and farther below the demand, and all sorts of calamities have been predicted if we do not increase the wheat output.

Mr. GALLOWAY. The production of wheat per capita in the last thirteen years has dropped from 9 to 7 bushels.

The CHAIRMAN. We are using other things; would not that account for it? All these investigations of food tend to utilize a lot of kinds of food that were not used before.

Mr. WOODS. We are exporting a large amount of wheat to China and other countries to which we never exported wheat before; and lots of flour. They are using wheat instead of so much rice. The possibilities of increasing wheat production in this country are enormous, but we do not propose to go beyond the demands of the wheat belt at the present time.

Mr. GALLOWAY. There is one point in connection with the macaroni industry in the Northwest. The millers in the Northwest have been worried for the last two or three years because they have not been able to get enough wheat to supply their mills. They have been pushing into Canada for wheat, and there has been considerable agitation there to get the tariff off wheat; but this entire wheat belt that is opened up to the macaroni wheats will enable us to supply the milling demand and also the export demand.

Mr. WOODS. The export demand for this macaroni wheat is larger than we will be able in the next forty years to supply. We have sent some of our wheat across there, and they say it is even better than the European wheat, and they will take every bit we can ship. The only question is to get enough of it. We expended $6,247 on that work this year.

The CHAIRMAN. Do you say it is about completed?

Mr. WOODS. It is about completed. To complete the milling test and to determine the question whether or not that wheat will deteriorate will take a year or two. So far it has improved in this country, and one or two years more of it will demonstrate the fact as to whether we are going to be able to hold it up without selection, which seems to be the case.

Mr. GALLOWAY. Two factories have started this macaroni industry here. One, I think, is in Rochester and one in Cincinnati. They use this particular macaroni wheat, and they put it up with a special American design on it to compete with the Italian product.

Representative HENRY. There are two establishments?

Mr. WOODS. There are three, I think.

Mr. GALLOWAY. We import about 16,000,000 pounds of Italian macaroni.

Representative HENRY. There is no reason why we should not supply it all here.

Mr. WOODS. Regarding my next item—quite a number of State experiment stations have undertaken, in cooperation with the Department of Agriculture, the general proposition of the improvement of field crops for their respective regions, by selection and hybridizing, and it has offered us an opportunity of getting the Department into close cooperation with the experiment stations to determine if such cooperation can be satisfactorily carried out.

Representative HENRY. That is what we have been working for.

Mr. WOODS. We are in cooperation now, in the whole Bureau, with about thirty-five or forty stations, but my office is in cooperation with about twelve or fifteen of those stations in this kind of work. We send our experts there and we divide the expense of the work with the station, the station furnishing land and laboratory supplies and supervision and we furnishing some one to take the field notes and keep the records. We divide up the expense in that way. Last year we expended $5,000 on that work. As a rule we do not go above a thousand dollars in any State, and in some cases we put in a very small amount. In some cases we are not putting in anything at all; they are simply carrying on the work and paying for it. If we can get the station to pay the whole expense we do not pay for it. We simply furnish what help we can furnish them, including seed and expert advice; but if they refuse to take hold of it unless they get some financial aid, we give them what we can where they have competent men to supervise the work.

The increase requested for that this year is $500, according to the Secretary's estimate, but we could make good use of $3,000 increase.

Now, in the physiological laboratory we have the general laboratory expenses, which include apparatus and general supplies, an expert physiologist, and three assistants. We expended $7,750 in that technical work this year, and we ask for an increase of $1,125.

The lines of work conducted under the general supervision of that laboratory are, first, the question of nitrogen-fixing organisms. The most expensive of all fertilizers is nitrogen, and the one that is most largely decreasing in the soils of the country. It was discovered a number of years ago that nitrification from the atmosphere took place mainly from the action of certain bacteria, and the problem has been how to increase those bacteria in the soil so that they will go on fixing nitrogen. The main organisms work in connection with leguminous crops, clover and peas and things of that kind. If a man's land did not contain these organisms he could not grow a good crop of clover, cowpeas, or any other leguminous crops. It has been determined by investigation—we did not determine it entirely, but it has been determined—that if these organisms are not present in the soil you can not get a good crop of clover, cowpeas, or any other leguminous crop unless you put on a heavy application of nitrogenous fertilizers. If you have nitrogen bacteria present without the fertilizer nitrogen in common poor soil, the clover, cowpeas, or other legumes will grow and produce a very heavy crop and take their nitrogen from the air; so that you increase the nitrogen in the soil if you turn the crop under.

We have been able to reduce the cost of applying these bacteria to the land. We found out first the life history of this nitrogen organism more completely that it has ever before been known. We have reduced the cost of applying it from $12 an acre to 3 cents an acre, so that it has become possible for us to supply these organisms for any leguminous crop to any part of the country at very slight expense.

Representative SCOTT. What do you call these organisms?

Mr. WOODS. They belong to the bacteria.

Representative SCOTT. Were you going on to say how you do it?

Mr. WOODS. Yes; we get cultures from the crops on soil where the nitrogen organisms are present. There are little nodules on the root. We crush these up and cultivate them in a certain culture medium which we are keeping secret, because we are afraid somebody will try to patent it. Various methods have been patented for furnishing pure nitrogen, and the patent rights make it very expensive for the farmer to get hold of this. That is partly the reason it cost $12 an acre, but we have perfected our method of securing pure cultures and increasing them to any desired extent.

Representative SCOTT. In regard to the fear you have of other ivestigators obtaining this process, is there no way by which you could give the people the result of your investigations and thus relieve them from the possibility of having such difficulty?

Mr. WOODS. As soon as we get the matter entirely perfected, as soon as we get every phase of it right where we want it, then we will patent it in the name of the Department of Agriculture for the people, and that prevents anybody patenting it. We have in the past lost some of the Department's discoveries in that way. We had one instance a number of years ago in the so-called vermorell spraying nozzle. That was worked out in Government time by a Government employee under Government instructions. When the man got it he resigned and patented it. The Secretary of Agriculture protested to the Patent Office and the Patent Office was going to annul the patent, when the man sued and the Supreme Court held that the man had the right to the patent. So we found the safest way to do is to keep these things quiet, and just as soon as we get a thing where we want it to patent it for the Government. That is what we have done in a number of instances, and what we propose to do in this instance.

These little organisms collect all their nitrogen from the air. We get them and put them on food which contains no nitrogen. In doing that we are able to increase their nitrifying power from one, which they had on the ordinary leguminous root, to five times their original power. We have a set of organisms which, instead of simply growing on clover as they did originally, will take clover or cowpeas and several other leguminous crops; that is, they become many times more valuable than they were originally. We are away beyond anything that has ever been produced before, and we are not interfering with any of the patents that at present exist, but we have the matter all ready, and it has been laid before the Patent Office, so that if anybody tries to come in we can block them.

Mr. GALLOWAY. We have spent a good deal of money in introducing new legumes from foreign countries with a view to spreading them over the South. In 60 per cent of the cases those things refuse to grow, but this throws light on the whole subject.

Mr. WOODS. Last year we secured the proper organisms for these new crops, and wherever we have sent those organisms the seeds are doing well.

We expended in this work this year $1,000, and we ask for $250 increase. It is not expensive. All we want to do is to get some large retorts, etc., made to prepare these organisms in large quantities to meet the demand for them.

Then, besides these organisms which grow in connection with leguminous crops, the soil contains a great many other nitrifying organisms. You can not grow leguminous crops in all places; but we are getting out those organisms that grow in ordinary soil conditions, and doing the same thing we did with those just described. We have used $500 for that purpose and we ask for $83 more.

Then we want to make an investigation of clover sickness of the soil. We think the clover sickness that is so much talked about is probably due to the absence of these organisms; but we want to make a special investigation of that. It is possible that it may be a parasitic disease like the so-called pea sickness.

The CHAIRMAN. Do you not find that an application of potash is useful?

Mr. WOODS. Sometimes it is a lack of potash, sometimes a lack of lime; but in many cases it is probable there is a parasitic organism that is attacking the plant. We want $500 to do that work. We are finding a great number of these parasitic growths that attack plants. They do harm not only to crops growing on land, but to water cress and all such things as that. They get into wells and reservoirs and such things, and the question is as to whether we can not exterminate those growths in the water, the same as we have been doing on land, Some of our preliminary experiments have indicated that we can, viz, that we can spray solutions in water for destroying these algæ without injuring the crop at all. We do not ask any increase for this work. We used $500 this present year. We will not need any more money for that. But in the cases where water used for stock or for drinking is contaminated we have asked for $750 increase for this latter work.

The Pacific coast laboratory and investigations. We found it necessary to establish in different parts of the country in carrying on our work and in distributing our materials certain centers. One of them is on the Pacific coast, where the conditions are entirely different from any other section. We expended out there on the Pacific coast altogether last year about $9,000. We have asked for an increase of about $2,000. I am leaving out some items in order to get over this rapidly. That is, according to the Secretary's estimate there will be a little under $2,000 increase for the work just mentioned.

In the Mississippi Valley laboratory, where the main base of our timber-rot investigation is located, we deal with diseases of forest trees and the organisms that cause the rotting of timber of all kinds, construction timber, fence posts, railroad ties, etc.

The CHAIRMAN. That was put in the bill last year?

Mr. WOODS. That was put in the bill last year. The work was started and we expended last year $10,000.

The CHAIRMAN. Is that repeated this year?

Mr. WOODS. That is repeated this year; yes.

Representative SCOTT. What did you do with that $10,000?

Mr. WOODS. In the first place, we have a laboratory there where we have to make a great many tests and where we have to have expert assistance and clerical help. We expended probably $3,500 for expert assistance. We get the laboratory from the Missouri botanical garden. We simply have to take care of it and furnish the gas, telephones, and such things as that. Our experts go from this laboratory into the various parts of the country. For instance, we have been working in the Black Hills Forest Reserve a good deal of this year, where about 60 per cent of the standing timber is dead, and the question is whether that timber can be prevented from further decay and used for construction purposes. We have taken samples of the dead timber and had it treated with different solutions and have found that by prompt action most of this dead timber can be saved and used for construction purposes. We have simply paid different people to do that work for us. It cost us $200 or $300 in each particular instance. We had those treated and some of them are used as posts, some as railroad ties, some as telephone poles, and we are watching the rate of decay. We had them sent all the way from the wettest part of Texas to the northern line of the United States to determine the rate of decay and determine whether our various treatments will prevent it. The money has been expended almost entirely for that work, collecting those data in the forest reserves and in different parts of the country. We have very little railroad fare to pay on this. The money is almost entirely expended for field investigations, exclusive of railroad travel for the principal men. The railroads furnish the transportation free for them.

Representative COONEY. Let me ask you a question there for information. You say you found these trees were rotting in the Black Hills—decayed, dead, or blasted?

Mr. WOODS. No; they were originally killed by the pine-bark beetle, which simply bores through the bark and young wood and kills the tree.

Representative COONEY. You found them in the wood?

Mr. WOODS. The dead trees were standing in the forest.

Representative COONEY. And decaying?

Mr. WOODS. Yes, sir.

Representative COONEY. You cut them down and made the application for preservation upon practically dead wood, then?

Mr. WOODS. The wood is dead; yes, sir.

The CHAIRMAN. Were the trees dying or entirely dead?

Mr. WOODS. The trees were dead when we took hold of them.

Representative COONEY. Your application for preservation is to make dead wood keep from decaying?

Mr. WOODS. To make wood which is dead but not rotten keep from decaying.

Representative COONEY. It is for the purpose of keeping this dead wood from rotting?

Mr. WOODS. Yes, sir; and what will keep the dead wood from rotting will keep any wood from rotting.

Representative COONEY. I thought it was to keep the trees from blasting, decaying.

Mr. WOODS. That is a different problem. That is what we call diseases of forest trees. We do a lot of work along that line, too.

Representative COONEY. It is to keep dead wood from decaying.

Mr. WOODS. That is to keep it from what we call timber rot.

Representative HAUGEN. What can you tell us about cedar posts coming from the Mississippi? Have you any knowledge on that?

Mr. WOODS. I do not know anything about it; no, sir. I simply know that red cedar is a very resistant wood. Its resistance is due to certain substances that are produced chemically in the cells during growth. You get naturally there what we have to put artificially in other woods. It produces a material which insects and fungi do not like.

Representative HAUGEN. I know they are shipping it into my country, and they are paying about 30 cents a post for it.

Mr. WOODS. You can grow in your country and in Nebraska and Missouri and all through that central section catalpa posts which will be very much cheaper than red cedar and just about as durable. They are very rapid growers.

The CHAIRMAN. You are getting these cedar posts from where?

Mr. WOODS. They are shipping them from Mississippi, and I think some from the coast.

The CHAIRMAN. I saw thousands of them in Mississippi as I went West last spring.

Mr. WOODS. In the tropical laboratory located at Miami, Fla., we are studying diseases of Southern truck crops especially, and whatever work we are doing on orange diseases we are doing from that laboratory in Florida and on the Pacific coast, at the laboratory in southern California.

We used last year for that work $5,141, and we ask an increase of $809. We have to pay an expert out of that and two or three assistants, to maintain our laboratory and 6 acres of garden there. We use that tropical garden also for making the first propagation of a great deal of the stuff that we get in on seed and plant investigation from this Congressional seed money, and also our orange and pineapple hybrids. We propagate seed there and test it wherever it is Southern material, and then send it North here and distribute it, if it is free from disease and insects. It is a sort of quarantine station, as well as propagating station and pathological laboratory. In our work we have the herbarium, where we have a collection of all the disease-producing organisms we are able to get hold of. This helps us to identify the various parasites that cause disease. These are sent to us by experiment stations and by farmers in all parts of the country. It is like a laboratory. It cost us $3,000 this year, and we ask for an increase of $333.

On the mushroom investigation we expended this year $600, and we ask for an increase of $533. We ask for that increase because heretofore we have imported into this country all the spawn from which we grow our mushrooms, an increasing food product. We have discovered a way of producing pure spawn not only of the commercial mushrooms but of many edible mushroom species, and that discovery will be worth a good deal to people who want to cultivate mushrooms.

Representative SCOTT. What do you mean by spawn?

Mr. WOODS. It is practically the seed It is the vegetable part of the mushroom, but it is a thing which we have imported almost entirely from France and England.

The CHAIRMAN. We have not produced it yet in this country?

Mr. WOODS. We have not produced it yet successfully in this country. Some people have tried it, but it is of such poor quality that it is not worth much. The difficulty even with the imported spawn is it is frequently mixed and quite poor, and a man who may have $10,000 invested in a mushroom plant may import his spawn, and if it is not pure and good he will lose heavily. This discovery shows that you can grow spawn pure the same as you can grow a pure race of corn.

The CHAIRMAN. The surprise to me is it has not been produced in this country before.

Mr. WOODS. Nobody has investigated it. They have simply bought their spawn in England and France, and they do not stop and think that it can be produced here.

Representative SCOTT. You use the word "spawn" as entirely synonymous with seed, do you?

Mr. WOODS. It is not synonymous with seed. It is more synonymous with potato tuber. It is part of the vegetative portion of the plant. It is not a seed in any sense, but you plant it just the way you plant the seed or the tuber. These little umbrella-like portions are really the fruits of the spawn. These umbrellas produce the spores. The spores are analogous to seed, strictly, and we use these spores in getting our spawn.

Representative SCOTT. Where does the spawn come from?

Mr. WOODS. It comes from the spores as they germinate in the soil. It is like the root of the mushroom. It spreads all through the soil, a little cobwebby growth. To get a crop you take the mushroom spawn in the earth in which it grows and plant the earth in the beds. With that, besides your mushroom spawn, you get all kinds of insects and diseases. You get very often two or three different kinds of mushrooms, some of which are nonedible. There is great uncertainty in the production of mushrooms from spawn, whereas if you produce them from spores you can be just as certain of what you get from mushrooms as from corn.

Mr. GALLOWAY. The final item is the general administrative work. This includes the rent of the buildings, the care of the buildings, and miscellaneous problems which are likely to come up at any time. Somebody writes "Cotton crop is being destroyed by disease." The Secretary says "Send a man down there and look it over." We have to have a certain reserve for these special calls, etc., which we figure at 10 per cent. We expended this year $10,320, and I have asked an increase of $3,280 to meet the demands of this work.

That covers the work of my office very briefly.

The CHAIRMAN. The committee will now take a recess until 2 o'clock, and at that time we will ask Mr. Woods more about these appropriations.

The subcommittee (at 1.05 p. m.) took a recess until 2 o'clock p. m.

AFTER RECESS.

The subcommittee reassembled at the expiration of the recess, Hon. J. W. Wadsworth in the chair.

STATEMENT OF ALBERT F. WOODS—Resumed.

The CHAIRMAN. Mr. Woods, in this note, on page 14, it is stated:

> List of persons paid from appropriation "Vegetable pathological investigations, 1903:" One pathologist, at $2,750.

Is that yours?

Mr. WOODS. No; that is the head of the pathological laboratory in my office.

The CHAIRMAN (reading). "Two pathologists at $2,500 each; one pathologist, at $2,250." That is, besides those that are on the statutory roll?

Mr. WOODS. Yes. Those are the experts in charge of the laboratories.

The CHAIRMAN. You have yourself, and then one assistant pathologist on the statutory roll, at $1,800?

Mr. WOODS. Yes.

The CHAIRMAN. Who is that at $1,800 and these other men at $2,500?

Mr. WOODS. That assistant pathologist is a man working on the Texas root rot. There is now no division, and there is no assistant chief.

The CHAIRMAN. That is the $1,800 man?

Mr. WOODS. That is the $1,800 man. That used to be the old assistant chief when my office was a division. We had a pathologist, and an assistant pathologist, at $1,800, and he was assistant chief; but in the reorganization the expert men were put in charge of laboratories, and this statutory place, which we have always had, was left for an assistant.

The CHAIRMAN. These are in no sense chemical laboratories, are they?

Mr. WOODS. Oh, no; not at all.

The CHAIRMAN. That gives you how many pathologists? Yourself, one at $1,800, one at $2,750, two at $2,500, one at $2,250. That makes six pathologists you have?

Mr. WOODS. Six pathologists; I think that is the number, not counting the lower grade assistants.

The CHAIRMAN. Do you need that number of pathologists?

Mr. WOODS. We could use more. When we have to put a man on a problem requiring expert knowledge, we have to get a good man; and it should be understood that these are not necessarily permanent positions. Some of these men are only kept a year. Some we keep two years and some we may keep five years. The one that gets $2,750 we have had fifteen years. He happens to be permanent.

Mr. GALLOWAY. He has not received $2,750 all that time. He started in at $1,000, when the pathological work was organized.

The CHAIRMAN. I suppose I should ask you this question, Mr. Galloway: In your judgment, how many of those people should be transferred to the permanent roll?

Mr. GALLOWAY. In the cases of these six positions——

The CHAIRMAN. How old a man is this $2,750 pathologist, on the lump-sum roll?

Mr. GALLOWAY. He is about 40 years old. He is a graduate of the University of Michigan, and came here when this pathological work was organized. I came there at the same time, in 1885, I think it was.

The CHAIRMAN. You are a Missouri man, are you not?

Mr. GALLOWAY. Yes, sir; I am a graduate of the University of Missouri, and he is a graduate of the University of Michigan. This man has been here for fifteen years. He started in at $1,000.

The CHAIRMAN. The other two pathologists, at $2,500 each, out of the lump-sum roll—are they permanent?

Mr. WOODS. They are probably permanent. At least, we keep that work up; but such a condition as this might arise in any of these cases, that if these men should drop out—resign or get other appointments—the man who was put in charge would be one of the assistants, probably, in the laboratory.

Mr. GALLOWAY. He might be getting $2,000, and it might not be desirable to raise him to $2,750.

Mr. WOODS. We would not want to raise him to $2,750.

The CHAIRMAN. You mean you would not want to put him in at that salary at once.

Mr. WOODS. Yes, sir; that is what I mean.

Mr. GALLOWAY. There is a certain amount of fixity to those statutory salaries that would embarrass us.

Mr. WOODS. We were paying him $2,000 here, and we put a $1,600 man in his place. We only pay him $1,600. The other $400 goes back into the work. All these higher positions are filled by men who have charge of very important work.

The CHAIRMAN. You have no physiologist, as I recall, on the statutory roll?

Mr. WOODS. No; not on the statutory roll.

The CHAIRMAN. Let us go to page 14. As this thing is printed we can not make any comparisons with last year's appropriations.

Mr. WOODS. This one on the statutory roll is my own salary.

The CHAIRMAN. That is for a physiologist and pathologist.

Mr. WOODS. Yes, sir. There is an assistant pathologist, but no assistant physiologist. The physiologists are all in the lump sum.

Mr. GALLOWAY. The physiological features have developed within the last few years, since the places for the pathologists were established. There would be no objection to transferring some of them.

Mr. WOODS. The physiologist in charge of the laboratory could be transferred.

The CHAIRMAN. Which one is that?

Mr. WOODS. One physiologist at $2,500.

The CHAIRMAN. There is no pathologist at $2,500; it is $2,000. In the note on page 14 there is one physiologist at $1,800.

Mr. WOODS. Two physiologists at $2,000. This is a misprint. One of those men is getting $2,500. There are not two physiologists at $2,000. There is a mistake there somewhere. One of them gets$2,5 00.

The CHAIRMAN. And one $1,800. You have here one at $1,800.

Mr. WOODS. Mr. Moore gets $2,500. He is in charge of the laboratory. Mr. Swingle is a physiologist. He gets $2,250.

The CHAIRMAN. You have two pathologists here at $2,500. Have you two at that salary?

Mr. GALLOWAY. Yes; there are two pathologists at $2,500.

Mr. WOODS. There is also one pathologist at $2,750. That is evidently not made up correctly. I do not know who made it.

Mr. GALLOWAY. I never saw this until this morning. I do not know anything about it.

Mr. WOODS. It is wrong. They have probably got pathologists and physiologists mixed up in some way.

The CHAIRMAN. You have one pathologist at $2,750. That is right. Then have you two pathologists at $2,500 or only one?

Mr. WOODS. We have one pathologist at $2,500.

The CHAIRMAN. Then you have a physiologist at $2,500?

Mr. WOODS. We have two physiologists at $2,500, but in order to get that entirely accurate I want to look at the record and see. I do not remember just how the salaries all stand.

The CHAIRMAN. Right after that, if you follow down, you will find one physiologist at $1,800, one expert at $1,400, one expert at $1,200. What do you mean by experts?

Mr. WOODS. Those experts are men that we pick up for certain problems. That is, one of these experts is used on tobacco diseases.

The CHAIRMAN. He is an expert pathologist, is he?

Mr. WOODS. An expert physiologist. They simply call him an expert?

The CHAIRMAN. One assistant at $1,200. What do you mean by that—assistant to the expert? It is right after that.

Mr. WOODS. Yes; those are assistant pathologists. The assistant physiologists came in as scientific aids at $480, and have taken the scientific examinations under the civil service, and were promoted.

The CHAIRMAN. You have only one of them, I see?

Mr. WOODS. There should be more than that.

The CHAIRMAN. Yes; you have more than that. Those are the scientific aids?

Mr. WOODS. They are the scientific aids.

The CHAIRMAN. One assistant at $1,200. He is not a scientific aid, though?

Mr. WOODS. One assistant at $1,200.

The CHAIRMAN. One expert at $1,400; one expert at $1,200; one expert at $1,200.

Mr. Woods. I do not know what that does refer to. The list is not accurate.

The Chairman. One artist at $1,000.

Mr. Woods. Yes; we have an artist at $1,000.

The Chairman. What does he do?

Mr. Woods. He is artist in the pathological laboratory.

The Chairman. Illustrating?

Mr. Woods. Yes; getting up illustrations for the bulletins we publish on diseases.

The Chairman. Then come four assistants at $960 each, and two assistants at $720 each. Those six are the scientific aids?

Mr. Woods. They were scientific aids who took an examination for promotion.

The Chairman. I say, they are scientific aids, promoted?

Mr. Woods. Yes.

The Chairman. Six of them? What do these men work at?

Mr. Woods. Under the instructions of the head of the laboratory they make cultures, and examine material microscopically and make reports of it. They go out into the field to help in spraying work or in work where a technical knowledge is required. We use them in the laboratories and also use them in the field work.

The Chairman. One carpenter, at $840. What use do you have for a carpenter there—for boxing stuff?

Mr. Woods. He was simply assigned to our roll while we are fixing up the laboratory. We will use him only a few months.

The Chairman. That is a temporary appointment?

Mr. Woods. A temporary appointment.

The Chairman. Is there any danger of his becoming permanent?

Mr. Woods. Not in my division. He was on the rolls of the Bureau.

The Chairman. Five laborers, at $720 each. What do they do for you, Mr. Woods?

Mr. Woods. Those laborers are really clerks or copyists. I suppose it is a misnomer. Included in those five laborers are several people who are practically scientific aids now. They started in as laborers, helpers in the greenhouse, or helpers in laboratories, and some of them have been there six, seven, or eight years. They have gradually got a knowledge of the higher class of work, but there has been no way by which they could take a civil-service examination and be promoted. They were appointed at the time when the Secretary had authority to make those appointments. Now they come in that class which the Civil Service Commission says should be ousted from the departments, but they are people we can not get along without, because we would have to train new men. We are gradually getting rid of them, though, and getting civil-service people. Whenever one drops out, that is the end of it. We never replace him.

The Chairman. What is the assistant curator, at $600?

Mr. Woods. That is an assistant in the herbarium, who has charge of the mounting of parasitic plants and things that come in. She takes those specimens and presses them and mounts them.

The Chairman. Three laborers, at $600 each; seven laborers, at $480 each. Then you have another expert here at $600. What do those ten laborers do?

Mr. Woods. Those are nearly all people that we have hired on cooperative work outside of Washington. That is, when we start to grow a patch of corn, for instance, the experiment station will sometimes say: "If you will give us a laborer to look after that, we will grow it for you."

We appoint the man for three months, or six months, or a year, whatever it may be.

The CHAIRMAN. These are not all by the year, then?

Mr. WOODS. No; these are nearly all by the month.

The CHAIRMAN. They are temporary?

Mr. WOODS. Yes.

Mr. GALLOWAY. I have a list of them here. Some of them are really clerks.

Mr. WOODS. Miss White is a clerk; she is one of the people I just spoke about who came into the Department in the document section, I think, originally. She was in the office when I came there. Mr. Galloway took away the file clerk, and she has been assistant file clerk, and she knew more about the letter files than anybody else. I have found she could look after that better than any other clerk I had, so I let her look after it. These people were all covered in last July by the order of the President, and although all laborers a few of them are still allowed to do the work they have always been doing, namely, semiclerical work.

The CHAIRMAN. Then some of those ten people classed as laborers must be clerks?

Mr. GALLOWAY. Yes; they are clerks.

The CHAIRMAN. What are they—copyists?

Mr. WOODS. Some might be classed as copyists, some as typewriter operators; some are copying matter and doing work of that kind occasionally. It is low-grade clerical work, work that would usually bring from $800 to $940 a year.

The CHAIRMAN. You have another expert there at $600. What is he an expert in?

Mr. WOODS. That is an assistant expert. She really should be called a scientific aid.

The CHAIRMAN. In making this report to us next year on that I wish you would look after that carefully, so that the name will indicate something of the work they do.

Mr. GALLOWAY. You can have that ready in a day, Mr. Chairman—a list of all these people and what they are doing in each particular branch. This was not gotten up by our office.

Mr. WOODS. We could have given this list entirely correct in fifteen minutes if we had been called on. This has been made up, probably, from an old list.

Mr. GALLOWAY. It does not agree with the Blue Book.

Mr. SPILLMAN. I will tell you how some of those things come. In our bureaus it is necessary sometimes on account of a statutory position. I had a statutory position in my office. I did not know anybody to put in it without promoting a man away beyond where he ought to go, so I let some one else have that statutory position, but I see it is charged here to my office.

Mr. WOODS. Most of these laborers are purely temporary, so far as my office is concerned. They may be here this month and gone next month.

Representative COONEY. They come in and go out just as they are needed?

Mr. WOODS. Yes; with some exceptions.

The CHAIRMAN. One expert, at $1,400; then one assistant. What is that—assistant to the expert?

Mr. WOODS. No; I do not know what that is.

The CHAIRMAN. These names do not show anything to the committee at all. It is a mixed-up mess.

Mr. **Woods**. It is entirely wrong. That is a scientific aid who is getting $480. Then this scientific aid at $300 is incorrect. That is a student assistant. The student assistant gives part of his time to the service. They are simply scholarships; that is all. They help in the laboratories.

The **Chairman**. These two laborers at $3 per diem and one at $1.50—what are they, temporary?

Mr. **Woods**. Those are purely temporary; yes.

The **Chairman**. Are they here in Washington now, for instance, those three?

Mr. **Woods**. These may have been over on the Arlington farm, where we were conducting some experiments.

The **Chairman**. They are actual laborers?

Mr. **Woods**. Yes; they are either doing plowing or something of that kind. One was a carpenter, at $3 a day.

The **Chairman**. You have another carpenter up above there at $840?

Mr. **Woods**. Yes. These carpenters and some of these laborers were used in that work, but this three-dollar carpenter is already off the roll.

The **Chairman**. Professor Galloway, from that list which would you think should be transferred, if any, to the statutory roll for the good of the service?

Mr. **Galloway**. I can not tell about this list; but those higher positions there, which are permanent, might very well be transferred to the statutory roll, and a certain number of scientific aids could be very properly transferred there, but not all.

The **Chairman**. I should keep them on the lump-sum roll, because they come and go a good deal, do they not?

Mr. **Galloway**. Yes; they do come and go.

Mr. **Spillman**. Their time limit is two years.

Mr. **Woods**. We could give you a list showing how many should be on our permanent rolls and how many on the lump-sum roll. We not only can show you what is being carried on the lump-sum roll now—clerks, laborers, experts, and scientific experts—but we will point out those that might probably be put on the permanent statutory roll.

The **Chairman**. But, understand, I do not think the committee wants to put the lower class of employees on the statutory roll; just the higher class and practically those who will be necessary in the future development of the Department.

Mr. **Galloway**. Yes; and still to allow enough elasticity to obviate difficulty in making transfers or details without paying a man more than he is really worth.

The **Chairman**. Under the lump-sum appropriation it would be a sort of probationary term. You take a man in there under the lump-sum appropriation and if he is not fit for promotion you need not promote him, or you can discharge him, and there will be no trouble about it.

Mr. **Galloway**. This man who is getting $2,750 was appointed for three months. When he first came there, fifteen years ago, he was engaged to study peach yellow. When the three-months term was up he was put on other work, and he is now in charge of the pathological laboratory.

The **Chairman**. In this Bureau—in the vegetable pathology, 19 laborers; in pomology, 2 laborers; in botany, 14 laborers; grass, 8 laborers; seeds, 18 laborers; Arlington, 12 laborers, and gardens and grounds, 13 laborers—86 people are classed as laborers.

Mr. **Galloway**. These people, while classified as laborers, are not all day laborers. They were covered into the civil service by a recent order of the President.

The CHAIRMAN. You see, it does not give to the committee any distinct idea at all.

Mr. GALLOWAY. When this matter was brought to the attention of the Civil Service Commission last July, the names of about 400 laborers in the Department were submitted to them. Probably 60 per cent of those were doing semiclerical work.

Representative GRAFF. But they were only getting laborer's pay?

Mr. GALLOWAY. They were getting laborers' pay. They could not get over $720 per annum; and the Civil Service Commission has ruled that the experience those people have gained in this work down there, no matter if it extended over fifteen years, will be of no benefit to them in the examination.

Representative GRAFF. When this order covering these people into the civil service was made, did that make them eligible for advancement?

Mr. GALLOWAY. No.

Representative GRAFF. It only insured their staying there?

Mr. GALLOWAY. That is all. It did not give them the same chance as an outsider would have in taking an examination. For instance, if Mr. A, a laborer working in the seed department, has had five years' experience, he takes the examination and competes with Mr. B, who has worked in Philadelphia. All the experience Mr. A has gained in his work with us would be thrown out and B's experience with that Philadelphia firm would be counted.

Mr. GRAFF. That would be counted in his favor?

Mr. GALLOWAY. It would be counted in his favor; yes.

Mr. GRAFF. Then I understand that having been covered into the civil service, they still occupy the position of not being eligible to advancement past the laborers' roll.

Mr. GALLOWAY. They are absolutely on the same footing.

Mr. WOODS. Most of these people who are mentioned as laborers on my fund are purely temporary and are doing strictly laborers' work.

The CHAIRMAN. It is understood, Mr. Galloway, that you will prepare a list of these people who could be transferred with advantage to the statutory roll.

Mr. GALLOWAY. Yes.

Representative GRAFF. Mr. Chairman, I suppose there would be cases where it would not be advisable to have them covered in permanently, where the Bureau might have a list of laborers that it would be advantageous to turn off when they were through with them.

The CHAIRMAN. Temporary employees.

Representative GRAFF. Yes.

The CHAIRMAN. Those would be kept on the lump-sum roll. I said only those that he thought would be of benefit to the service would be transferred to the statutory roll.

Representative GRAFF. I can see how this Bureau would have more of that sort of people than possibly any other bureau, because there are only certain seasons of the year when they can be utilized.

The CHAIRMAN. You must have a much greater temporary roll in the summer time in your outdoor work than you do in the winter.

Mr. WOODS. Yes. There are times in the summer, especially when the field work is at its height, when we have to have a number of laborers, and then they drop off perhaps the next month.

The CHAIRMAN. Is there much pressure brought on you by Congressmen and others to keep them during the winter?

Mr. WOODS. There can not be now, because they are all covered in.

Representative SCOTT. What do you mean by saying they are all covered in?

Mr. WOODS. What I mean is, there is a Department civil service committee that is supposed to determine the qualification of all laborers according to a specific rule which the Civil Service Commission has furnished. They fill out one of those requests and statements and file it in the Department, and certifications are made from this list. If we want a laborer we go to that committee and ask for certifications and they certify three names.

Representative SCOTT. That will not apply in cases where you are employing some man out in Illinois to attend to an acre of corn, will it?

Mr. WOODS. That only applies to the city of Washington. Outside we hire whom we please.

Mr. GALLOWAY. If we need a charwoman, we write a letter, and the Secretary refers the letter to this board of labor employment, and they certify three names to the Secretary of three women who have shown by their experience that they are able to do that work. Then we select the one at the top, or any one of the three we please.

The CHAIRMAN. That is a temporary employment?

Mr. WOODS. Yes; this covers temporary and all other places in the District of Columbia.

The CHAIRMAN. For a day or a week?

Mr. WOODS. Yes; also permanent laborers.

Representative COONEY. You can discharge him whenever you are ready?

Mr. WOODS. Yes.

Representative COONEY. They must be very scientific individuals that you can employ for a day at a time.

The CHAIRMAN. We will pass along now to the next; that is, "Pomological investigations."

Mr. GALLOWAY. Mr. Chairman, if you are through with pathology now, Mr. Taylor, who was to discuss pomology in detail, is not here, and Mr. Spillman, who has charge of our grass and forage plant work, will answer any questions the committee desires to ask.

STATEMENT OF FREDERICK V. COVILLE, CHIEF OF THE OFFICE OF BOTANICAL INVESTIGATIONS AND EXPERIMENTS, DEPARTMENT OF AGRICULTURE.

The CHAIRMAN. We will now take up the botanical work, at page 15. There is something new in that clause, Mr. Coville. First, there are the freight charges, telegraph and telephone charges. Then "subscription to and purchase of botanical publications." The words "for use in the division" were omitted. Did we not strike that out of the bill last year—"subscriptions to and purchase of botanical publications?"

Mr. COVILLE. No, sir.

The CHAIRMAN. Did we allow that to stay in there?

Mr. COVILLE. It was in last year, Mr. Chairman.

The CHAIRMAN. I thought we had struck it out and let the purchase of all those books come through the library.

Mr. COVILLE. No, sir; it was in last year's bill.

The CHAIRMAN. We struck it out in some places, do you not remember, Mr. Henry?

Representative HENRY. Yes; but not this one.

Mr. **Coville**. I have last year's act here, and the words "subscription to and purchase of botanical publications" appear.

The **Chairman**. You have left out the words "for use in the division." Is that intentional?

Mr. **Galloway**. There is not really a division.

The **Chairman**. That is true.

Mr. **Coville**. That was simply a verbal change to make the bill conform with the present organization of the Bureau.

The **Chairman**. Now, you have in there, "to investigate drug and medicinal plants and to conduct experiments in their cultivation and preparation; also work tending to the development of drug plants having greater or more constant pharmaceutical value."

Mr. **Coville**. That, too, Mr. Chairman, is simply a question of wording. The beginning of our last year's act reads: "Investigations relating to medicinal, poisonous, fiber, and other economic plants." In this year's bill the word "poisonous" was omitted in the first clause, and this latter clause was put in simply to more specifically describe our investigations on medicinal plants. It is not a new provision.

Representative **Scott**. The word "poisonous" appears in the first line.

Mr. **Coville**. I misspoke myself. The word "medicinal" does not appear in the first line. The word "poisonous" does appear.

The **Chairman**. Then that is immaterial. Then you have "To collect specimens and materials illustrating economic plants and their uses and prepare them for permanent filing in an economic herbarium."

Mr. **Coville**. That is also a change of wording. In last year's act, in the third line, occurred the clause "the collection of plants, traveling expenses, and express charges." The words "the collection of plants" are omitted in this bill. This also is simply a case of rewording.

The **Chairman**. Is it necessary?

Mr. **Coville**. It is not strictly necessary. It simply straightens out the present bill, and gives a little better idea of what our work is. It is not absolutely necessary, but it is desirable.

Representative **Graff**. Have you been conducting the investigations heretofore from the standpoint of the medicinal properties of plants?

Mr. **Coville**. Our work in that line was comparatively limited until last year, when we decided, so far as our means permitted, to revise it somewhat. We are importing about nine or ten million dollars' worth of crude drugs a year, some of which we are confident can be cultivated in this country, and others of which might possibly be.

Representative **Graff**. How long has that been going on?

Mr. **Coville**. Working actively as we are now, it has been going on for only one year. Provision for work on medicinal plants has been in our bill for the last fifteen or twenty years—simply the words "medicinal plants;" but only recently, when the development of agricultural methods seemed to make it possible to take up some of these new crops which would be additions——

Representative **Henry**. For instance, what?

Mr. **Coville**. Chicory, for example. We imported from Belgium immense quantities.

Representative **Henry**. We import from Belgium immense quantities of that?

Mr. **Coville**. No; we raise it now. Five years ago we imported a quarter of a million dollars worth a year.

Representative **Henry**. We are not importing it now?

Mr. COVILLE. We are not importing it, practically. The imports amount simply to a few thousand dollars.

Representative GRAFF. Is it now a matter of commercial growth in this country?

Mr. COVILLE. Yes; there are large areas in this country which are devoted to chicory growing.

Representative GRAFF. What other medicinal plants?

Mr. COVILLE. I did not refer to that as a medicinal plant.

Representative GRAFF. Chicory is a matter of food, is it not?

Mr. COVILLE. Yes, sir. I am simply saying that this is one of the plants which have recently been taken up as additions to our American crops. One of the things which we propose to take up in connection with medicinal plant work is the production of morphine, for example, which we believe can be made an American industry.

Representative SCOTT. What is the name of the plant?

Mr. COVILLE. It is grown from a poppy.

Representative HENRY. The poppy can be grown here, you think?

Mr. COVILLE. Yes; it can be grown here.

Representative HENRY. Most of it comes from Asia Minor, does it not?

Mr. COVILLE. It largely comes from the province of S'Chuan, in China.

Representative HENRY. I always supposed that our poppy growth was very largely in Asia Minor.

Mr. COVILLE. The poppy is cultivated extensively in Asia Minor, but I believe that our principal imports are from China. Our imports for smoking purposes are largely through San Francisco. Our imports for morphine are largely through New York. We import over a million dollars' worth of licorice a year—nearly two million dollars' worth. Both these plants grow very easily in this country, but it is a question of ascertaining the conditions of commercial possibility and practicability.

The CHAIRMAN. You have left out that clause that was put in last year "and to investigate, in cooperation with the Bureau of Chemistry, the cause of the deterioration of export grain, particularly in oceanic transit, and devise means of preventing losses from those causes."

Mr. COVILLE. I do not know how that was left out. It was a mere accident; and I meant to call the matter to the attention of the committee.

The CHAIRMAN. You want it reinserted, then?

Mr. COVILLE. It ought to be reinserted.

Mr. GALLOWAY. That was left out, Mr. Chairman, in the making up of the items in our disbursing office.

Mr. COVILLE. If you would like, I should be glad to tell you what that provision means. The grading of grain at our grain centers and our ports of export, as at present conducted, depends upon a purely personal judgment of the character of the grain. The chief grain inspector at the port of export, for example, has to pass on every carload of grain which comes into that port. He decides the most important feature of the grading, namely the content of moisture, by touch. He runs a tryer into a carload of corn, pulls out a sample, and tries it it his hand. On the basis of his judgment regarding the moisture, a whole shipload is certified as of a certain grade. The purchaser in Europe buys it and pays for it on the basis of that certificate. The terms of purchase are that he shall pay for it in accordance with its grade as certified.

A few years ago many complaints came from abroad that corn certified as No. 2 reached foreign ports in a damaged condition. Some of it was rotten. We were asked to look into the matter, and we found that the main question was the moisture content of the corn or of the wheat. We found, furthermore, that the critical point in the deterioration of corn may and does frequently lie between 11 per cent of moisture and 13 per cent of moisture. It is a pretty serious thing to compel a grain inspector to judge between those narrow limits by a sense of touch, and we are simply devising a means of ascertaining, by cooperation with the Bureau of Chemistry, the actual moisture. We are cooperating with the chief inspectors, and we shall be able by and by to put into their hands an instrument for that purpose. We tried an electrical apparatus and failed on it. We are now trying a drying apparatus. We shall put into their hands an instrument by which they can say, "This corn has such and such a moisture content." It will insure them against all sorts of charges of incompetence and dishonesty, and will protect the trade against possibilities of error in the inspection of grain. The provision should go in. We do not want to discontinue that work.

The CHAIRMAN. You ask for $10,000 additional, Mr. Coville, over last year. Last year we increased you how much?

Mr. COVILLE. Ten thousand dollars last year. I can answer that best by showing you some of the work we are doing. I simply wish to say that this is a step forward in the line of developing some of the work we are already engaged in. No actually new work is proposed to be taken up during the coming year, but it is a development of certain new features along the old lines.

Here is a sample of Kentucky blue-grass seed, with the appearance of which you are doubtless familiar. It looks like a good sample of seed, but its germination is only one-quarter of 1 per cent. It cost us about $5,000 to find out what was the matter with that seed; but the expenditure of that $5,000 will be worth millions to the people who have been buying that sort of seed heretofore.

We came to the conclusion, from a series of tests of blue-grass seed, that something was the matter with the method of harvesting; so we sent a man down to Lexington, Ky., and had him examine every detail of the harvesting. When the seed is fully mature it shatters, and the growers can not let it get entirely ripe on the stalk. When it is nearly ripe they run through it a sort of comb. They have a machine drawn by horses, which combs off this seed with the hull and everything on it, still slightly green. It is piled up in winrows, turned from time to time and allowed to dry, and then it is thrashed. Our man found that the temperature of the interior of those winrows often went up as high as 150° F. He drew samples from every part of the winrow, and we made afterwards germination tests of these samples. We found that a a temperature of 150° would kill the blue grass seed. That is the whole story.

The CHAIRMAN. With a heavy rain right after it was put in the winrow it would spoil very fast, would it not?

Mr. COVILLE. The heating often takes place within twenty-four hours. We want to do the same thing——

The CHAIRMAN. How do you propose to remedy that? Please state that before you leave that point.

Mr. COVILLE. There are two ways of remedying it. One is to put it under cover, and, instead of piling the seed in winrows, to spread it thin on the floor of a covered building. But that, as you can readily see, is very expensive.

The CHAIRMAN. That would take a great deal of floor space.

Mr. COVILLE. The other way is to devise some apparatus by which it can be artifically dried at a low temperature. We are now experimenting with a grain-drying apparatus in which we propose to put this seed and dry it with a cold blast. We think we shall be successful in carrying that out. It is a perfectly simple matter. A great deal of grain nowadays is dried by cold blast or by an only moderately warm blast. The old method of drying grain was to heat it up hot and force the moisture off.

The CHAIRMAN. Is that the average percentage of germination in Kentucky blue grass, one-fourth of 1 per cent?

Mr. COVILLE. No. The average percentage in Kentucky blue grass, however, is very low. An average of samples bought in the open market would perhaps be 20 or 30 per cent, but we get occasional samples, properly harvested, which go to 90 or 95 per cent.

The CHAIRMAN. Is not that a good deal dependent on whether the weather happens to be good?

Mr. COVILLE. No; it is bound to heat in the winrows if they are not turned every few hours, and the conditions are often such that they can not be turned.

Representative COONEY. Is the seed that is combed off saved?

Mr. COVILLE. It is all combed off.

Representative COONEY. Where does the winrow come in?

Mr. COVILLE. The combed seed is piled in great winrows.

Representative COONEY. What do you call a great winrow of that?

Mr. COVILLE. They are piled in winrows of about 2½ to 3 feet high.

Representative HAUGEN. The seed is separated from the grass then, is it?

Mr. COVILLE. The main grass stems are not with the seed, but the flower and seed stalks are. The pile at the base is as wide as that [indicating].

The CHAIRMAN. It is like a small hay winrow?

Mr. COVILLE. Yes.

Representative HENRY. But it is very compact.

Representative COONEY. Why do they not put it in smaller winrows? Have they not plenty of room outdoors?

Mr. COVILLE. Of course we simply investigated the industry in the form in which we found it. It may be that they can do the work better by piling it in smaller winrows. We have recommended to them that they so handle it that it shall not be allowed to heat, but, as the chairman has said, the question of rainfall comes in. It is often very difficult to protect it from rain and dew in any other way except by piling it in large winrows.

Representative COONEY. Where does the best blue-grass seed come from?

Mr. COVILLE. It comes from the vicinity of Lexington, Ky.

Representative COONEY. The highest percentage of good seed?

Mr. COVILLE. It is not a question of percentage of germination. It is a question of suitable soil in which to grow blue grass.

Representative SCOTT. How do you test the percentage of germination?

Mr. COVILLE. We count out several lots of 200 seeds and put them under certain germinating conditions, sometimes in soil, sometimes in a germinating chamber, and give them an alternating temperature. We found, by the way, that we could not germinate this seed at a uniform temperature. It requires a temperature alternating between 20° and 30° centigrade—eighteen hours of the former and six hours of the latter. This simply represents the conditions occurring in spring and fall, cold nights and warm days. Then it will sprout, but it will not sprout properly at a uniform temperature of either 20° or 30° centigrade.

The CHAIRMAN. I am surprised at that.

Mr. COVILLE. We are conducting some investigations along that line that will help a great deal in the matter of the method and season of planting, etc.

Another piece of work that we have undertaken is that on poisonous plants. Our work in that connection has largely been on the western stock ranges. The ranchers have suffered great losses, particularly in the northern Rocky Mountain region, from their sheep, more especially, being driven onto large areas which contain, among the nutritious vegetation, poisonous plants. We have been investigating that subject for about two years and our method is this: Taking a plant which has been supposed to be poisonous, we make a fluid extract of it and inject it into a rabbit. If he has no symptoms of poisoning, we simply assume that that is not the plant that has been causing the trouble. If he does give symptons of poisoning, we then secure a sufficient quantity of the plant and isolate its poisonous substance. Injecting that into a rabbit we find out what physiological effects are produced. Having found the physiological effects, we then experiment with antidotes which will counteract those effects. A proper antidote having been learned, we begin to experiment with sheep. We give a fatal dose of the poison to a sheep and then proceed to ascertain the proper amount of the antidote. In every stage of the experimentation we are proceeding on a basis of precise and exact facts. These methods have enabled us to save hundreds of thousands of dollars a year to the people of Montana.

Representative SCOTT. Is it a safe and a conclusive test to inject this poison into the blood? Is it not true that there are some poisons which can be injected into the blood directly without harm and yet which if they pass through the alimentary canal result fatally?

Mr. COVILLE. That is true, of course, of certain animal poisons. It would be true of the poison of the rattlesnake, for instance, but it is not true of the plant poisons.

Representative SCOTT. It is not?

Mr. COVILLE. No, sir.

One of the poisonous substances for sheep that was examined was extracted from the poison camas in the Northwest.

Representative SCOTT. How do you get the antidote, and can a sheep select his antidote as soon as he has got his poison?

Mr. COVILLE. I will give you information about that. The poison of that particular plant is absorbed by the system very slowly.

Representative GRAFF. The sheep has to take some chances on your getting the right antidote?

Mr. COVILLE. Yes. The poison is absorbed by the sheep very slowly. As soon as the sheep is down we have ascertained that by immediately giving him permanganate of potash with a little sulphate of aluminum (added to increase its oxidizing powers) the poison remaining in his stomach is disorganized and there is no more poison to be absorbed.

Representative GRAFF. Where did you make those experiments on the sheep; out there?

Mr. COVILLE. They were made out there; yes, sir.

The CHAIRMAN. Then does the sheep survive? Do all get well, or only a certain percentage?

Mr. COVILLE. Most of them get well if they are taken in time. I want to go a little further and say that the antidote, permanganate of potash, has to be taken into the stomach and is given from a bottle—a solution of it poured down the animal's throat.

The CHAIRMAN. How much in liquid form; a tablespoonful?

Mr. COVILLE. No; it is usually in much larger doses. We usually give about a pint. The amount of the solvent is unimportant.

The CHAIRMAN. What is the cost of that a pint?

Mr. COVILLE. Its cost is comparatively little.

The CHAIRMAN. Simply the labor of giving it?

Mr. COVILLE. It is a question of labor.

Sometimes several hundred sheep are affected when a herder drives his band to a new area. We have known cases in which a thousand sheep from a single band have been prostrated by this poison.

The CHAIRMAN. At the same time?

Mr. COVILLE. At the same time, it often happens that hundreds of sheep are taken at one time. We found that the permanganate remedy could not be applied by a single herder quickly enough to save all his sheep; so we conducted some more experiments and we found that this poison was given off from the body very rapidly in the urine. That fact at once gave us a clew to the proper treatment of the sheep. We simply give him a diuretic; I have here a proper dose of this diuretic antidote. That is not given in the stomach, but is given by a hypodermic syringe. A man can carry enough of that with him to resuscitate a thousand sheep. The syringe with which it is given is a very compact affair. We use the form recommended by the Bureau of Animal Industry.

The CHAIRMAN. Have you taken advantage of this?

Mr. COVILLE. They are taking advantage of it quite extensively.

The CHAIRMAN. What is that poisonous root in the Panhandle of Texas that kills cattle?

Mr. COVILLE. Loco weed.

The CHAIRMAN. Have you done anything along that line?

Mr. COVILLE. No, sir; we have not been able to take up loco weed. We can not take it up until we either divert ourselves from this Northern range country, which we have not by any means straightened out yet, or have more money.

The CHAIRMAN. Do you get any demand from the Panhandle?

Mr. COVILLE. Yes; we have a great many letters regarding loco weed, but we simply reply that we have not sufficient information.

Representative WILLIAMS. Have you not about finished this? You say you have found out the antidote.

Mr. COVILLE. We have found the antidote for that particular one, but we are already engaged in working out another poison which is also very important in Montana and the Northern country—lupine.

Representative WILLIAMS. If you have Montana rid of one poison why can you not come down and get Texas rid of one?

Representative HENRY. Is lupine a weed?

Mr. COVILLE. Yes; it is a weed.

The sheep men of Utah and the sheep men of Colorado are both asking us to come there, but it is impossible for us to go to all of these places at once.

The CHAIRMAN. In the North what other things have you got to investigate in these poisonous roots or grasses?

Mr. COVILLE. We have paid some attention to a larkspur in the northern country. That yields, to a certain extent, to the same treatment as the poison camas, but it also needs some further investigating. There are probably, altogether, in the northern Rocky Mountain country a dozen plants each one of which ought to be investigated.

Representative WILLIAMS. Are you destroying the plants themselves?

Mr. COVILLE. No, sir; not on the ranges. There is one plant which it is possible to destroy, the water hemlock, which grows in restricted areas along the streams. One root of that as big as a walnut will kill a cow, and it is possible to eradicate it; but with the upland plants on the great ranges it is simply out of the question. On land worth perhaps a dollar and fifty cents an acre the poisonous species could not be eradicated for several times that amount.

The CHAIRMAN. We gave you an increase of appropriation of $10,000 last year. Did you apply that to anything specifically?

Mr. COVILLE. We readjusted work in all of our lines. We did not apply that to any specific investigation. We simply readjusted the work and applied it here and there, where it was needed.

The CHAIRMAN. If the committee should decide to give you this $10,000 more than you ask, would you apply that specifically to anything, or would you bring out your present lines?

Mr. COVILLE. We do not contemplate taking up any entirely new line of work. There are certain extensions of our work which we would, however, make. For example: In connection with the tropical agricultural work which we are authorized under this provision to take up, we want to do something more in the rubber business. We are importing about twenty-five or thirty million dollars worth of crude rubber a year, and the manufacturers are appreciating that the visible supply of rubber is not a permanent one, to say the least. The subject of rubber cultivation is a burning question to the shippers and manufacturers of rubber.

Representative HENRY. I thought the manufacturers were organizing themselves and establishing plantations in Central America, in Bolivia. I know they are selling their stock all through the country.

Mr. COVILLE. I think you will find those are not the rubber manufacturers? You will find they are land development companies.

Representative HAUGEN. Can you grow rubber here in competition with old Mexico with labor at $2 a month?

Mr. COVILLE. No; we can not grow it here.

Representative HAUGEN. I mean in this country.

Mr. COVILLE. We can grow it in Porto Rico.

Representative HENRY. I had a proposition not long ago from one of those promoters, and he claimed that in six years they can grow rubber trees in Central America and South America that are fit to produce a percentage of rubber, and so on, and that the productive area there is ample for all the rubber we shall want. That is the promoter's story.

Mr. COVILLE. It is a very complicated question. It is found that rubber trees will grow luxuriantly under climatic conditions where they will not produce a quarter of a pound of rubber a year.

Representative SCOTT. Is there any part of the United States where they will grow and produce rubber?

Mr. COVILLE. Yes, sir; we have made inquiries into this question, and we find that, contrary to what has been supposed heretofore, a uniform rainfall and a uniformly moist climate is not necessary in the production of rubber, but that the rubber-producing trees do grow in climates where there is an alternating wet and dry season.

Representative WILLIAMS. Do they grow above the frost line?

Mr. COVILLE. No, sir.

Representative WILLIAMS. You do not mean there is any place in continental United States where they can be grown?

Mr. COVILLE. No, sir.

Representative HAUGEN. Can they not be grown in Mexico?

Mr. COVILLE. They grow in Mexico one of the rubber trees most promising for cultivation. You understand there is a great variety of rubber trees; that the different kinds are widely separated in their botanical relationship. One of these is native in southern Mexico, in Tehuantepec. A portion of our rubber supply comes from that area, but the forests are being rapidly depleted.

Representative HENRY. Where did you propose to grow this under the flag—in the Philippines?

Mr. COVILLE. Our proposition is to understand first the conditions under which rubber culture is possible, to find out the conditions under which the rubber tree can grow and produce rubber. Until we have found that out we can not propose to grow it anywhere. That is an absolutely essential preliminary.

Representative SCOTT. Is not that already known, Mr. Coville? Rubber has been a commercial article for a great many years.

Mr. COVILLE. Rubber from plantations?

Representative SCOTT. Yes, sir; I understand so.

Mr. COVILLE. In America?

Representative SCOTT. No; not in America; in the world. Has not the experience of the world demonstrated the facts that you say you need to acquire?

Mr. COVILLE. The government of India has grown in India a tree called Assam rubber, which does not grow wild in America. The Hollander has grown Assam rubber in Java, and is now experimenting extensively in gutta-percha growing; but the rubber trees of America, the Para rubber of Brazil and the Central American rubber, are totally different trees and grow under different conditions. These and the Ceara rubber tree of Brazil, which grows in a region distinct from that of the Para rubber, has not been commercially cultivated. There are no plantations which are self-supporting. All these plantations are experimental, and many of them are absolute failures because the conditions under which a rubber tree produces rubber are not properly understood.

I have drawn up a statement in connection with our estimates of some of the things that we have wished to do which call for a great deal more money than the amount here proposed. It is simply a catalogue of the things we want to do in the coming few years. If you are interested in hearing it I should be very glad to give it to you.

The CHAIRMAN. Read them over.

Mr. COVILLE. One is the appointment of a rubber expert, regarding which I have already spoken to you. Another is the question of a coffee expert. I do not know whether you wish to go into the details of what a coffee expert may do; but we have already demonstrated some very important facts in regard to coffee, the application of which will probably revolutionize the industry.

The CHAIRMAN. Have you any idea that it can be grown in this country?

Mr. COVILLE. It can be grown in Porto Rico.

The CHAIRMAN. I mean on our continent.

Mr. COVILLE. Oh, no.

The CHAIRMAN. Not in the United States?

Mr. COVILLE. No. Porto Rico, so far as the amount of available land suitable for coffee culture is concerned, could grow half the coffee we import, which amounts to from fifty to eighty million dollars a year.

Representative HENRY. Is the area sufficient?

Mr. COVILLE. The area is sufficient.

Representative HENRY. Then, with the Hawaiian Islands in addition, we can probably grow all our coffee?

Mr. COVILLE. So far as the area is concerned, we can do it. There are certain other commercial considerations, however, which will require us to grow a great deal of cheap coffee in Brazil for a long time to come.

The CHAIRMAN. Is there any coffee grown in Hawaii?

Mr. COVILLE. Large quantities of it.

Representative GRAFF. When you speak of Porto Rico, do you mean on the supposition of devoting most of the land in Porto Rico to that industry?

Mr. COVILLE. There are certain areas in Porto Rico which are suitable for sugar, certain other areas suitable for coffee, and other lands which are suitable for tobacco.

Representative HENRY. And those lands are entirely distinct?

Mr. COVILLE. The hill lands; yes, sir.

Representative HENRY. That is a mountain country?

Mr. COVILLE. You could hardly call it a mountain country.

The CHAIRMAN. They grow sugar and tobacco on the lower part of the island?

Mr. COVILLE. Yes, sir.

The CHAIRMAN. Then you get into the mountains and they grow coffee and bananas and fruit?

Mr. COVILLE. Yes, sir.

Representative SCOTT. Is it a good grade of coffee?

Mr. COVILLE. It is a good grade of coffee. It brings a higher price in Europe than Brazilian coffees do; but comparatively little has been imported into the United States.

Mr. COVILLE. I could talk to you five or ten minutes and show you that——

The CHAIRMAN. Go ahead; we would like to hear you.

Mr. COVILLE. You are all familiar, of course, being farmers, with the influence of clover on the regeneration of soils. It has been insisted in some coffee-growing districts that the coffee must be shaded. In other districts it has been insisted that shade is not essential. We find in those districts in which the shade of coffee is considered essential that the sort of shade which has been employed is leguminous trees. The effect of the shade is not to improve the quality of the coffee. It has a certain collateral effect in sheltering the ground to prevent it from washing, but the chief beneficial effect of the shade lies in the fertilizing of the soil by the roots of these leguminous trees, in precisely the same way in which clover roots fertilize the soil of pastures and meadows. That fact has not heretofore been recognized, and it is likely to revolutionize methods of coffee culture.

We found, curiously enough, that the aborigines of Mexico, at the time of the discovery of this country, knew that fact in connection with the cultivation of cacao. They cultivated their cacao plants under a certain leguminous tree, which fertilized the soil. They called it the "mother of cacao."

Representative SCOTT. Will the clover grow in a coffee country?

Mr. COVILLE. We do not propose to put clover there. We have suggested that in certain areas in which the cultural conditions will permit it, and where shade is not necessary for collateral reasons, cowpeas and other leguminous crops be grown, and we believe that in that way we may entirely change the methods of coffee culture. Of course on the steep slopes cow-peas probably can not be used, because the soil would gully.

Representative WILLIAMS. You would have to leave the trees there to keep the soil from washing off?

Mr. COVILLE. Yes, sir; there, to a certain extent, the ground must be protected.

Another thing: We are growing in different parts of the world coffees derived from the same original stock, some of which are imported into this country at 6 cents a pound, and others are brought in at three or four times that price.

Representative GRAFF. And yet all these different coffees come from a common stock?

Mr. COVILLE. All from the same stock, with the exception of a certain portion called Liberian coffee, which is of a distinct species. All of our commercial coffee practically comes from the Arabian coffee tree. We have an idea that those varying qualities of coffee are connected only in part with differences in varieties, but that they may be connected in a very prominent way with fermentation which takes place in the curing. The development of the aroma of the vanilla is purely a question of fermentation. The vanilla pod as it grows on the plant has not the slightest suggestion of vanilla flavor, but by a process of fermentation, which requires considerable skill, the vanilla flavor is brought out. We are inclined to the view that some of the flavors of these high-priced coffees are produced by a process of fermentation, the exact conditions of which will cost a great deal of investigation, perhaps years of patient inquiry.

The CHAIRMAN. Where is the best grown now?

Mr. COVILLE. Coffee, do you mean?

The CHAIRMAN. Yes.

Mr. COVILLE. Well, you are familiar with the coffee that is grown in the mountains of Jamaica, the Blue Hill coffee, which brings a very high price. A coffee grown in Hawaii, the Kona coffee, is a high-priced coffee. Porto Rican coffees are higher priced than Brazilian coffee.

The CHAIRMAN. And you think it is all a question of fermentation, do you, not all climate, soil, etc.?

Mr. COVILLE. It is partly doubtless a matter of soil and partly a matter of variety; but our suggestion comes from this, that in those places in which these high-priced coffees are grown the berries are picked off the trees and allowed to lie on the ground, or are kept in large quantities together, so that they undergo a process of fermentation; that is, the methods in those localities are old-fashioned methods of hand cleaning. The methods that are pursued in Brazil, where our cheap coffee comes from, are methods in which machinery comes into play. The coffee berry does not have time to ferment at all. It is picked off the tree, run through machines that take its pulp and parchment off, and comes into the market in a fresh-dried condition.

Representative GRAFF. So that the best coffees are those which are fermented or handled in a primitive way?

Mr. COVILLE. Yes, sir; in the old-fashioned way. We may be able to demonstrate, after careful investigation, that a Brazilian coffee, by being carefully handled and fermented, may be made into just as high class a coffee as the Blue Hill coffee of Jamaica; and if so, that is the kind of coffee we want to grow in Porto Rico.

Representative GRAFF. Some one said at the time we acquired Porto Rico, about this coffee of theirs, that it was a fine coffee, but that the taste for it had to be cultivated; that it was not a coffee that was popular with people when they first used it.

Mr. COVILLE. The Porto Rican coffee was largely sold in Spain and the Porto Ricans have not got in the habit of grading their coffee, so that when it is bought on the New York market you can hardly get two bags alike, and the New York dealers do not want to handle it at all. Until the Porto Ricans grade their coffee, so that we can get a uniform product, the American market will be against Porto Rican coffee.

Representative HENRY. You say that coffee is all from one source. If you take some of the Brazilian coffees you will find in one bag of coffee a comparatively small round berry, and in another bag, which is frequently called Java, though it comes from Brazil and is grown in Brazil, you will find a large flat berry. Are those originally from the same source?

Mr. COVILLE. Yes; and probably grown on the same tree also. The coffee berry has two seeds in it, and when both seeds develop they press against each other and flatten their faces. If for any reason one seed does not develop, the other one grows and takes its place, and becomes round. There is an apparatus by which the two kinds are separated. The coffee is put on an inclined plane and the round seeds roll off. They constitute the so-called peaberry coffee.

Representative HENRY. All grown on the same trees?

Mr. COVILLE. Yes.

Representative HENRY. And sold for different prices?

Mr. COVILLE. Yes, sir.

Representative HENRY. I was told by a coffee merchant once that all these varieties of coffee originated in his store. He said he got them all, and he assorted the Javas and the Mochas and the Mexican berries and all the balance of it, owing to the size and shape.

Mr. COVILLE. In certain regions, owing to certain climatic conditions, there is a predominance of one-seeded berries. In other regions there is a predominance of two-seeded berries. The Blue Hill coffee is largely made up of two-seeded berries.

Representative WILLIAMS. That is Jamaica coffee?

Mr. COVILLE. Jamaica coffee; yes.

Now, in connection with the poisonous-plant work—I do not know, Mr. Chairman, whether you wish to go on with these explanations.

The CHAIRMAN. Yes; finish what you want to say.

Mr. COVILLE. In connection with poisonous-plant work we want to have money enough to hire men all the time to do certain phases of this work. For certain portions of our work we employed men for two or three months in the year, men who were doing work of the most difficult character and of the highest value, but we could not keep them on the year round. We want to employ some more men of that sort, and we would then be able to investigate some of the other poisonous plants that we can not touch now.

We want to extend our work on the methods of harvesting seeds. There are certain other seeds, in addition to Kentucky blue grass, which are injured during the process of harvesting, and we wish to take up and carry through precisely as we have taken up that one.

We want to look into the question of transportation and germination of tropical seeds. A good many of the seeds which Americans are now using in Porto Rico have to be transported long distances. That is the case with the india-rubber-tree seed, for example, of two varieties of india-rubber trees, the Para rubber and the Central American rubber. If they once dry out, they are dead. The methods of transporting and handling those and many other tropical seeds we want to experiment with. The old method of handling those plants—the method largely followed by European nations in dealing with their tropical colonies—has been to germinate the seeds, set them out in what is called a Wardian case, a sort of little chicken coop with glass top and ventilated, and send them by vessel. They can be sent around the world if properly handled; but if we find suitable methods of packing seeds we can, for the same price, send a thousand times the quantity.

In the matter of fiber plants we have been confronted with certain commercial conditions that are important. The increase in the use of binder twine, largely through the invention of a successful corn binder—the Western corn is now bound with a binder the same as grain—has affected the fiber market. One of the best fibers for binders' twine is sisal, which is cultivated in Central America and in the Bahamas, and we are now undertaking to make some suggestions to Porto Rico and to Hawaii in regard to the cultivation of it; but we ought to have a little more money in order to take it up properly.

The CHAIRMAN. You will do that, will you not, through the experimental stations direct?

Mr. COVILLE. Yes; we will do it in cooperation with the experiment stations.

The CHAIRMAN. It will not be necessary for you to send any men there, will it?

Mr. COVILLE. It will not be so necessary to send men to Hawaii and Porto Rico as to send them to the places where sisal has long been cultivated and allow them to form a judgment as to the prospects of its culture in our own territory.

The CHAIRMAN. Where is it grown now?

Mr. COVILLE. It is grown in the Bahamas and it is grown in Yucatan.

Representative GRAFF. Does it not come from the Philippines?

Mr. COVILLE. No, sir; the Philippine fiber is Manila hemp.

Representative HENRY. Sisal is a little cheaper quality, is it not? It is a coarser fiber?

Mr. COVILLE. Yes, sir.

Representative HENRY. Sisal is a hemp, is it not?

Mr. COVILLE. Do you know the century plant or agave?

Representative HENRY. Yes.

Mr. COVILLE. Well, sisal is an agave. The plant has not the slightest resemblance to hemp.

There are some of these coarse fibers that will grow in this country. Lecheguilla will probably grow in New Mexico and Texas. It is very similar to sisal.

The CHAIRMAN. Is there anything else you want to say?

Mr. COVILLE. I have simply indicated to you some of the lines of work that we want to take up in the future, and it is along this line we want to apply the $10,000 we ask for.

The CHAIRMAN. The increase you ask for?

Mr. COVILLE. Yes, sir.

The CHAIRMAN. Did you ever make any more experiments in growing that winter melon in Utah that you gave me once? Astrachan melon, was it not?

Mr. COVILLE. No; Turkestan. In reference to that, we followed the suggestion made in the committee to-day—to turn the matter over to outside agencies—and I am very much afraid the cultivation of that melon has disappeared.

Representative GRAFF. You sent a few seeds to all the members, did you not? There was a winter muskmelon, I know.

Mr. COVILLE. Yes; that was the one.

Representative GRAFF. I know I had a few tried, and I do not think there were any raised in my district.

Mr. COVILLE. Where was that?

Representative GRAFF. Central Illinois, in the vicinity of Peoria. I will tell you the experience with it. I let my brother-in-law try it. It was a winter muskmelon. He has a very fine winter garden and a nice place. We went out in the garden and found that the trouble is, the vines are so exceedingly tender that bugs and things of that kind just ate them up.

Mr. COVILLE. They were a failure everywhere east of the arid region, but under irrigation in the arid West in certain localities they did very well.

The CHAIRMAN. I remember the one you gave me grew there.

Mr. COVILLE. Yes, sir; that grew in the Green River Valley of Utah.

The CHAIRMAN. I think, if I remember rightly, that you told me they could be kept in a dark, cool cellar away into the winter.

Mr. COVILLE. The one you have the principal recollection of I think you ate in January?

The CHAIRMAN. Yes; that was picked when?

Mr. COVILLE. In September.

Representative WILLIAMS. We do not want melons all winter.

Mr. COVILLE. This would not compete with the watermelon. This was a muskmelon.

Representative GRAFF. The trouble was, the vines would be eaten up. They were very tender.

Mr. COVILLE. They were a failure throughout the East. In the arid regions they did very well. The perpetuation of the industry was probably a question of providing a market for the melons. Whether their cultivation has absolutely disappeared we do not know. We have not followed the thing up. But if those melons had been properly marketed, I believe a carload of them would have brought $1,000 in New York City at Christmas time. The men who were growing them perhaps did not have the facilities for marketing them.

The CHAIRMAN. Who grew that one for you out there?

Mr. COVILLE. I do not recall the man's name now.

The CHAIRMAN. He was a ranchman, a fruit grower.

Mr. COLVILLE. He was a seed grower. He had been growing watermelon seeds on contract.

Representative WILLIAMS. Did it taste like a canteloupe?

The CHAIRMAN. No; but it was very good, though it was not as good as a real good canteloupe.

The subcommittee (at 4.30 p. m.) adjourned until Tuesday morning, December 9, 1902, at 10 o'clock.

STATEMENT OF MR. W. J. SPILLMAN, IN CHARGE OF GRASS AND FORAGE PLANT INVESTIGATIONS, DEPARTMENT OF AGRICULTURE.

The CHAIRMAN. I see, Mr. Spillman, there is a new provision for the rent and repairs of a building, not to exceed $1,200 per annum. Let us take that up first. We will pass by that new provision of "For telegraph and telephone services; for gas and electric current." We understand that is put in to cover the Treasury Department's requirements.

Mr. SPILLMAN. That is just a few dollars.

The CHAIRMAN. The next is "The rent and repairs of a building, not to exceed one thousand two hundred dollars per annum."

Mr. SPILLMAN. In that connection I will say that at present my office is on the fourth floor of the Department of Agriculture, in the attic, and that to-day I had to send my clerks home on account of the wind blowing as cold as it did. It was impossible to stay there; and not only that, but the room up there is not sufficient. For instance, we have an herbarium of grasses up there that is the largest collection of botanical specimens of grasses in the world. We have that piled up in a room in such shape that we can not use it, because we simply have no room for it.

I may say another thing in connection with that. There are 78 stair steps to reach that room. The assistant in my office died of heart disease from climbing those stairs, I think. A messenger boy on another part of the floor died with heart disease, and my messenger boy was four months in the hospital with enlargement of the heart from climbing those stairways. I am a little bit selfish in the matter myself.

The CHAIRMAN. Only a few years ago we had no elevators at all, anyway.

Mr. SPILLMAN. Well, I can not help that.

The CHAIRMAN. I guess there is a predisposition to heart trouble, and this intensified it.

Mr. SPILLMAN. It is a rather serious matter to climb 78 steps at once. Of course 24 or 48 are not serious, but 78 steps, especially in the case of the messenger, who has to run up and down those steps ten or fifteen times a day, are even somewhat dangerous. That, however, is not so much the question as it is a matter of room.

The CHAIRMAN. What do you propose to do—hire a house out there?

Mr. SPILLMAN. Yes.

Mr. GALLOWAY. There is just one point there, Mr. Chairman. This is not an increase. It is simply authority to expend money for that purpose.

The CHAIRMAN. I know that. Do you propose to get one of those small houses in the neighborhood?

Mr. SPILLMAN. Yes, sir; one of those small houses in the vicinity.

The CHAIRMAN. That is an additional charge against your appropriation, because you have to heat it and light it, and all that. There will be so much less money available for investigations, in addition to the $1,200.

Mr. GALLOWAY. The house that is in mind is one that has been used by one of the other branches of the Bureau, and the heating plant is all in it. It will be vacated by another branch of the Bureau which has moved into larger quarters. The money was authorized for that last year. I believe that is correct, Mr. Spillman.

Mr. SPILLMAN. Yes; that is correct.

The CHAIRMAN. I notice you ask an increase of $10,000, Mr. Spillman.

Mr. SPILLMAN. I may explain that. I only knew Saturday how much increase the Secretary had asked for me, so that what I might say now about the use of that $10,000 would have to depend somewhat on circumstances. There is very much more than that needed to carry out lines of work that have been begun in the office. I can give you a very close approximation.

The CHAIRMAN. Do you mean to carry out to a successful conclusion those new lines of work within a year?

Mr. SPILLMAN. Some can be carried out to a successful conclusion within a year, and others can not. In one case my own estimates show a decrease in the estimate for one line of investigation of $3,600. In other lines there are increases. In this particular line—that is, range investigation—we hope that in five years we may complete all we can do properly in our investigation on the range—that is, counting this coming year as the first of the five—and it is possible we can do so in three. We should like to do this if it is possible, because there are other lines of work that are very pressing. We have very urgent demands for information which we can not furnish regarding grasses and forage plants, and we want to get in condition to furnish this information.

The **Chairman**. What kind of information? Can you name some of them, what information they are asking of you?

Mr. **Spillman**. I can give you some of the general classes that are most urgent. You know the western half of the United States has a rainfall which in general is less than 20 inches, and the common cultivated plants of the East, such as timothy and clover, can not be grown without irrigation; yet there are thousands of men who have gone out there and have settled on dry land, where the rainfall is not over 10 inches. We get very pressing, urgent requests from those men, and they usually end by saying: "I am a very poor man, trying to make my way on a homestead on a dry ranch. I want to know what plants could be grown here without irrigation." Well, we do not know, and it takes some rather extensive investigation to find such plants as that. We want to undertake work of that kind, and in fact we are doing work of that kind now, and we have found at least one kind that is very valuable under just such circumstances as that.

Representative **Cooney**. What plant is that?

Mr. **Spillman**. It is one I shall have to give you a botanic name for, Mr. Cooney.

Mr. **Cooney**. You need not answer the question then.

Mr. **Spillman**. Canadian lime grass is a translation of it. That is a very common relative of the common Terrill grass which grows wild in Virginia and through the South. It grows very readily with 10 inches of rainfall and makes very good hay, too. I think I know of other plants that can be introduced into regions like that and enable thousands of men to make a living who are not now making a living.

The next most urgent call is for information about forage plants in the Southern States. The farmers down there have been growing cotton for a hundred years, and I noticed in traveling through the South that the farmers down there took good care of the cotton crop, but any other crop is not properly taken care of. They know how to take care of the cotton crop. These other crops are only grown in a small way, experimentally as it were, and the farmer needs information about those crops. He does not know what crops to grow and he does not know how to grow those that he ought to grow. We want to undertake investigations with forage plants in the South. We do not always know what to tell him ourselves, and we want to find out. We want to be able to give him reliable information. It is true there are certain things we can tell and we do tell him. I should say we answer on an average from ten to twenty letters a day from farmers in the South and from farmers in the far West. Those are the localities where most of the correspondence about these grasses and forage plants comes from. We answer them and give such information as we can, but frequently we get letters that we simply can't answer at all. Those are lines of work which we wish to extend.

Representative **Graff**. In regard to the answers to these letters which are written to you, suppose the letters which you write, if they contain some substantial information are published in the community, are they not?

Mr. SPILLMAN. Very frequently.

Representative GRAFF. They serve something more than simply a personal end, then?

Mr. SPILLMAN. Yes; the other day I had a letter from a physician in New York City, Dr. John Wyeth, who owns several thousand acres in northern Alabama. He had asked me what forage plant could be grown there. In passing through Alabama this summer I stopped and saw his place, and learned all I could about conditions in that State. I took a team and wagon and went into the country. I saw what was growing and what was doing best. I studied the types of soil upon which these things were growing, and I think I was able then to give him some reliable information. When I got home I wrote him a lengthy letter, stating what my opinion was, and within two days I got a reply from him, asking if he might have the privilege of publishing that in a local paper down there for the benefit of the farmers. Of course we were very glad to have him do that. That is a very frequent occurrence.

Now, here is another line of work which is more important perhaps than it would look on the face of it. Along both edges of our continent and along the Great Lakes and along some of our large water courses there are areas of drifting sand. Originally these were in most cases covered with grasses and were harmless, but the short-sighted policy of our people has been to use everything in sight and let the future look out for itself. They have let the stock denude these sand dunes of their grasses and the result is that now the sand dunes are getting up and traveling. They are covering up valuable land.

Representative WILLIAMS. Let me ask you something there. I do not know that it has much to do with this, but I presume you are acquainted with Dr. Phares.

Mr. SPILLMAN. Of the Mississippi experiment station?

Representative WILLIAMS. Yes; and his pamphlet on grasses and forage plants in the South. It is a very able, complete, and exhaustive thing. What strikes me in connection with this whole matter is that nothing is ever finished. Certainly Dr. Phares could have given that man much more complete information. You could have given him more by sending him Phares's pamphlet than you could by writing him a letter.

Mr. SPILLMAN. Since Dr. Phares's pamphlet was written we have discovered a number of plants that are of the very greatest value.

Representative WILLIAMS. Why not issue a new edition of Phares's pamphlet?

Mr. SPILLMAN. He might object to that.

Representative WILLIAMS. In connection with other things, treating them in the same way, with the additional information that has been obtained about new plants, and have them ready there to send out.

Mr. SPILLMAN. That is virtually what we do all the time. When we issue anything, we include what Professor Phares said, and also Professor Stubbs in Louisiana and Professor Starns in Georgia and Professor Soule in Tennessee.

Representative WILLIAMS. The first letter I ever wrote here to the Department of Agriculture was to try to get them to find something that would be a winter grass in the South that would withstand southern heats.

Mr. **Spillman.** We have it. I can give you the names of four of them now.

Representative **Williams.** I have written a letter every Congress upon that subject, and I would like to get it, by the way, because it is a desideratum. Our trouble is not taking care of the cattle in the summer.

Mr. **Spillman.** What you want is a winter pasture grass. I can give you four of them. One thing I am very anxious to do is to experiment with these four and secure one that I think may be valuable in the South as winter pasture. Berseem is one. It comes from Egypt and is grown there in alternation with rice crops, and is undoubtedly adapted to that work in the South.

Representative **Williams.** I wish you would get out a little leaflet or pamphlet on the subject.

Mr. **Spillman.** Take this instance of berseem. I want to appoint a scientific aid at $480 a year. We can get very good men at that price. I want to send him to the Southern States and let him find farmers who are willing to sow an acre of this berseem and see what it will do down there. It has not been tried yet. I want to say this: That just simply getting the seed and sending it out here and there to a farmer has proved a failure. We imported a valuable lot of seed a few years ago——

Representative **Williams.** Pardon me; one word right there, because we are all interested in this matter. Instead of hunting a farmer who will do all that, why do you not, when you get this thing, send some seed, for instance, to the experiment station in Mississippi, the experiment station in Louisiana, or the experiment station of Alabama or Georgia and just have the Secretary of Agriculture instruct them, as he has a right to do, to experiment with that grass.

Mr. **Galloway.** They will not do it.

The **Chairman.** Who will not do it; the Secretary?

Mr. **Galloway.** The Secretary will direct them, but the experiment stations will not do it.

Representative **Williams.** Then we will cut off their appropriation if they will not behave themselves.

Representative **Graff.** On looking at that statute the other day, Mr. Williams, I noticed that it is very peculiarly worded. A superficial reading of it would make one think the Secretary had some power; but when you come to analyze it, about all the power he has is advisory power.

The **Chairman.** It is mandatory upon the Secretary to indicate from time to time the investigations that these experiment stations shall make.

Representative **Williams.** If you request the experiment stations to do it, they do it.

Mr. **Spillman.** We are doing that very thing with all the stations that will do it, but some of the stations write back to us like this. They say: "We have more than we can attend to now. We have only $15,000 to work with. We need $100,000. If you will furnish us the money, we will do it."

Representative **Williams.** You spoke about that Egyptian berseem. I wish you would send it right to the Mississippi experiment station, and you put in your letter that I said they should experiment with it, and they will do it.

Mr. **Spillman.** We will send it to them. There are numerous other grasses that I could mention, but I presume it is hardly necessary to take the committee's time.

The CHAIRMAN. No; we do not want to go into that now. We want the items of the expenditures.

Mr. SPILLMAN. In regard to that sand-binding work I spoke of, we want to increase on that. We want to establish at least two stations where we can study methods of propagating things which we know will grow in sand. That has never been done in this country at all. We know a hundred things that will grow in pure sand. We want to study the methods of propagating, and in order to do that we have got to have more money. Heretofore it has not been done because we did not have the money.

The CHAIRMAN. Have not some of your large investigations been closed, so that some of the money you have used heretofore may be used for that now? You see it is a constantly increasing appropriation.

Mr. SPILLMAN. From that range investigation we are turning $3,600 in other directions.

The CHAIRMAN. But, notwithstanding that, you want $10,000 more?

Mr. SPILLMAN. Yes.

Representative WILLIAMS. I want to read the language of this statute:

> That in order to secure as far as practicable uniformity of methods and results in the work of said stations, it shall be the duty of the United States Commissioner of Agriculture to furnish forms, as far as practicable, for the tabulation of result of investigation or experiments; to indicate from time to time such lines of inquiry as to him shall seem most important; and in general to furnish such advice and assistance as will best promote the purposes of this act. It shall be the duty of said station annually, on or before the 1st day of February, to make to the governor of the State or Territory in which it is located, a full and detailed report of its operations, including a statement of receipts and expenditures, a copy of which report shall be sent to each of said stations and to the said Commissioner of Agriculture and to the Secretary of the Treasury of the United States.

Representative GRAFF. According to the previous part of that, Mr. Williams, while it is true that it is the duty of the Secretary to do that, yet it does not seem——

Representative WILLIAMS. When it makes it his duty to indicate from time to time such lines of inquiry as to him shall seem most important, then it is made their duty to follow them out. In another part of the act the language is: "To make experiments and investigations under the direction of the Secretary of Agriculture." This language "under the direction of" is the language of the act.

Mr. GRAFF. But the other gives them power to spend it for practically what they please.

Representative WILLIAMS. Here at one time we made this stronger, if anything. We put the language of this act in one of our appropriation bills, and we went on further and said that we should use the money under the direction of the Secretary, and they had no right to use it in any other way.

Mr. GRAFF. But they have been doing it. They have been using it, I guess, in salaries, from what Mr. Scott says.

Representative ALLEN. I see you have condemned Johnson grass, and I learn from other sources that Johnson grass is a valuable forage plant.

Mr. SPILLMAN. I write letters every day that contain both those statements.

Representative ALLEN. It is a very valuable forage plant for the man who has it.

Mr. SPILLMAN. Johnson grass is the worst pest there is in the South, but when it becomes established on land it is extremely difficult to get rid of. But if a man will make up his mind when he has it that he will use it, it is a very valuable forage plant.

Representative WILLIAMS. That is true. It is coarse forage. It makes very good feed.

Mr. SPILLMAN. We are cooperating now with 23 experiment stations. My office alone is doing that. Dr. Woods is cooperating with others. Mr. Coville I know to be cooperating with others.

The CHAIRMAN. Are you establishing any experiment stations of your own?

Mr. SPILLMAN. We have not so far, but we are very anxious to do so.

The CHAIRMAN. The committee has always been opposed to that sort of thing. We claim those experiments ought to be made through the experimental stations. If you once open that door you will have demands from every county in the United States that wants to make an experiment in grass.

Mr. SPILLMAN. But we pay no attention to those demands at all. If a region of country presents a problem, we go into that region of country and solve that problem the best we can. We absolutely do not permit local influences of any kind to have anything to do with our investigations. We are after the problem for the country. Now, here is an experimental station in Oregon. We had last year a cooperative agreement, and we were going to furnish them $400 to experiment on sand-binding grasses. There is one of the best places for experiment at the mouth of the Columbia River there is in the United States. Yet the Oregon station was so busy last year, its officers' energies were so taken up, that they could not do a thing. This year we are going independent, and have already sent a man from California up to the mouth of the Columbia River to make an experimental plantation of beach grass, because the Oregon station said they had no time to do anything with it at all.

The CHAIRMAN. If they had no time last year, will they not have time this year?

Mr. SPILLMAN. They declined to enter into an agreement with us.

The CHAIRMAN. These things can not all be done in a year or ten years.

Mr. SPILLMAN. Let me call attention to one other line of work. Some of these lines of work are practically new work. There are in every State in the Union a good many acres of land, sometimes amounting to many thousands—I think in the State of Illinois it amounts to some 220,000 acres of valuable land—that is either swamp land or is overflowed at various seasons of the year. Those lands are frequently used for hay. The wild grasses that grow there are cut for hay. Now, no study has ever been made, so far as I can find, of these swamp grasses that are cut for hay. In Wisconsin there are thousands of acres of such hay cut.

Mr. GRAFF. It is the richest kind of land, too.

Mr. SPILLMAN. Yes, it is the richest land we have, but this land is useless unless it happens to be set in those native grasses. I sent a man up to Wisconsin last summer, and he studied those grasses. We found out what it is the farmers are cutting for hay. We did not know before. We want to take the seed of those grasses and take it down to Missouri and Illinois, Kentucky, Ohio, and other places where there is such overflowed land and sow it on that overflowed land and see if we can not get it started there.

Representative WILLIAMS. You mean land that is annually overflowed?

Mr. SPILLMAN. Yes; particularly when it overflows with the spring freshets. You have lots of it in your State, you know. That land is as rich as it can be.

Representative GRAFF. You do not take a large body, do you?

Mr. SPILLMAN. I just take a few acres and sow a little bit of this and a little bit of that, the idea being to find out what will grow. When we find that out we will go to work and have a few acres of these things grown for seed, and just as soon as it becomes a commercial proposition we drop it. It is our duty to carry those things to the point where the farmer will be in position to take it up for himself. At present the farmer is not. He can not get the seed on the market. He does not know the particular plant. You can not buy it, and we want to carry it to the point where the seed is put on the market. Then we drop it at that point.

We have begun work in these directions already. This sand-binding work has been going on ever since this office has been organized, but funds have been insufficient to permit us to do anything more than simply to explore. I have in my office now a stack of reports on what the men found growing on sand dunes and the condition of the sand dunes, the areas that are covered by this drifting sand. We have that information now. We want to go to work and find out and to advise men how to cover these drifting sand dunes with grass. To do that they must have a little more money than suffices to permit a man to travel across the sand-dune area. That is what this $10,000 is for. It is to begin definite experimental work on problems that have been in a preliminary condition.

The CHAIRMAN. They have been in a preliminary condition for a good many years, Professor.

Mr. SPILLMAN. The reason is that the funds of the office have not permitted anything more than preliminary studies. We want to get some of these things behind us. That is one reason some of these problems are not behind us to-day. Take that sand-dune proposition. If we could have used $10,000 on that three years in succession, it would have been enough, and we would not have needed another cent on that problem.

Representative GRAFF. One practical trial of one year would not be sufficient to demonstrate anything?

Mr. SPILLMAN. I should say a practical trial of less than three years would certainly not be sufficient time within which to demonstrate things of this nature. The seasons differ so much that one year might give different results from the average year.

Representative GRAFF. Suppose you take this past year. I do not know whether it was so in the South, but we had an unexampled amount of rain all through the Mississippi Valley, such as I never saw before in my life. It rained nearly every day.

Mr. SPILLMAN. And the results we would get in a season like that can not be relied on. The year before there were six months in some parts of the country without a drop of rain. It is absolutely necessary, in order to get reliable results, to carry these things over several years.

There are a good many of these problems. If we can get the money to carry on the investigations they will in time pass by, and we can then take up others that are pressing.

Mr. GALLOWAY. There is just one point I want to make here. Under the old organization of the Department there was a division of agrostology, and Professor Scribner was in charge. Professor Scribner a year and a half ago resigned his position to go to the Philippines as chief of the Bureau of Insular Agriculture. When the bureau was established it seemed to me there was an urgent necessity for reorganizing that grass and forage plant work on the basis that would appeal more directly to the farmer. Professor Scribner had devoted his interests largely to exploration work and to a certain extent to the distribution of seed. With that object in view, the man selected for that purpose was a man who had been identified with the agricultural element of agrostological work—that is, the real grass and forage problem had been handled in such a way by Mr. Spillman in connection with the experiment stations in the West that he was brought here, and he has not had really an opportunity yet to shape up the work where it would have been if he had had five years more showing; so he is speaking now largely from the standpoint of the work as he found it, and also, of course, from the standpoint of the work as he would like to develop it.

The CHAIRMAN. Did you come from one of the experimental stations, Mr. Spillman?

Mr. SPILLMAN. I had charge of the agricultural department of the experiment station in the State of Washington for seven and a half years just prior to coming here.

Representative WILLIAMS. Is that berseem a winter grass?

Mr. SPILLMAN. Yes.

Representative GRAFF. I want to ask this question, Mr. Spillman. I suppose it is self-apparent, however. I presume experiments in grasses in one locality, such as this, would not be of any value except to the people of this latitude?

Mr. SPILLMAN. Yes; and that is one thing that people sometimes overlook. We may take grasses over here on the Arlington farm, where we have a nice little experimental plat, and grow them over there, and they will behave in a certain way. That is valuable for a region of a few miles around Washington City here, perhaps 50 or 70 miles; but if you go 100 miles south you get wholly different results. So it is absolutely necessary to duplicate this work in the various States. We undertake to do that generally by cooperating with the experiment stations in the State. Sometimes we have very different conditions in various parts of the State. I am more familiar with the State of Washington than any other. Western Washington and eastern Washington are as different as New York and Tennessee, fully as different; and we had to establish two experiment stations in that State, one supported wholly by the State legislature, because the work we were doing on the east of the mountains was of no avail at all on the west side.

Representative GRAFF. Every State in the Union is interested in this subject.

Mr. SPILLMAN. Oh, yes, sir.

Representative WILLIAMS. I think the most important thing in existence in the shape of an institution, if we can ever get it to do good work and do it right, is this appropriation we make every year for these State experiment stations.

Representative GRAFF. I agree with you, but it does not seem to me, Mr. Williams, that these men ought to be allowed to take Federal money and apply it for the purpose of paying salaries for the conduct of their agricultural colleges. It seems to me it ought to be done as a supplemental work in connection with the work of our Department. Do you not think so?

Representative WILLIAMS. It ought to be just what it says it is—experiments, and yet the fact remains that they are not doing it.

The CHAIRMAN. I think there has been a great improvement in it in the last six or seven years.

Mr. GRAFF. Suppose we write in there some sort of legislative conditions now.

Mr. GALLOWAY. Mr. Spillman was a station officer for seven years, and a teacher in an agricultural college. I should be glad if you would allow him five minutes in which to speak from that standpoint.

The CHAIRMAN. We would be very glad to have him do so. Do not think, Mr. Spillman, that we are trying to cut you off. We are very glad to hear you. You have been here about a year now, Mr. Spillman?

Mr. SPILLMAN. I have been here just a year at the end of this month.

The CHAIRMAN. What do you find to be the difference of cost of living here and in Washington?

Mr. SPILLMAN. I should say it is about 30 per cent greater here than in the State of Washington—20 to 30 per cent.

Representative HENRY. Rent is higher?

Mr. SPILLMAN. Rent is higher here and food is a little higher here than it was out there.

Mr. GALLOWAY. The general policy of our Bureau and of some of the other bureaus is to encourage the experiment station to cooperate with us. All of our cooperation with the stations is mutually helpful.

The CHAIRMAN. I think that is the original intention of the law.

Mr. SPILLMAN. That is the intention of the law, but we are doing that by moral suasion, so to speak, rather than by forcing this view on the stations. We have in the Bureau about 35 stations with which we are cooperating. In some they insist on cutting that thing off sharp and distinct, but these college presidents who have insisted on maintaining the station as a distinct thing hardly realize yet what is going on. We have been a little afraid they would reach that, but they have not seen it. But we can go to the meetings of the experiment stations now and we can wield an influence there indirectly, so that we can almost bring about a change suggested at this last meeting, and it will only be a year or two when we can bring that around.

The CHAIRMAN. My idea is that the experimental stations should be the eyes and ears of the Secretary—his observers, his scouts as it were—and that in these experiment stations all the experiments should be made under the supervision, perhaps, of the highest class of men that the Government could afford to employ here, and that perhaps the salaries of the experiment stations would not justify.

Mr. SPILLMAN. It will probably be interesting to all of you to know that the original bill for the establishment of those experiment stations was drawn on the very lines you have indicated. But at the time it had no chance whatever of passing in that form, so a gentleman who was then president of the Agricultural College of Iowa came on here to Washington, and, in conference with the then Commissioner of Agriculture, drew a bill which was as nearly like that as they could get support for from the various States, and it was passed; but the original bill contemplated that all of these things should be under the direct and immediate supervision of the then Commissioner of Agriculture.

The CHAIRMAN. And that here should be employed the highest order of scientists.

Mr. SPILLMAN. The highest order of scientists, and all under the direction of the Secretary.

The CHAIRMAN. And they should have practically supervisory control of the experiment stations and the experiments going on in them.

Representative **GRAFF**. That is where the present statute is too vague.

Mr. **SPILLMAN**. Yes: it was a compromise measure of those who on the one hand desired it to be an organization under the control of the Secretary and of others who desired it to be an independent organization.

The subcommittee (at 12.25 p. m.) took a recess until 2 o'clock.

AFTER RECESS.

The subcommittee reassembled at the expiration of the recess, Hon. J. W. Wadsworth in the chair.

The **CHAIRMAN**. The next in order, I believe, is "Experimental gardens and grounds."

Representative **ALLEN**. On what page is that?

The **CHAIRMAN**. It is on page 16 of the old bill and on page 12 of the new bill, at the top.

ADDITIONAL STATEMENT OF BEVERLY T. GALLOWAY, CHIEF OF THE BUREAU OF PLANT INDUSTRY, DEPARTMENT OF AGRICULTURE.

The **CHAIRMAN**. The next item in your bill is the pomological section.

Mr. **GALLOWAY**. Mr. Chairman, with your permission, I would like o refer again to that item on page 5. There is a clerk added on page 5. From the discussions we had last year it was our understanding that we were to submit a list of clerks and others that were on the lump sum, and then arrange them column by column, so that you could see just exactly what was on the one side and what was on the other. We did that, but the disbursing officer, I find, changed things somewhat.

The **CHAIRMAN**. We sent to him, and he is now having printed the bill in the form in which we want it printed—the way the law provided it should be printed.

Mr. **GALLOWAY**. There is only one point, then. We omitted one clerk of class 3, $1,800, and we ask simply an increase for that one.

The **CHAIRMAN**. It should be three clerks, then?

Mr. **GALLOWAY**. It should be three. It is, in the case of the clerks on the other side.

The **CHAIRMAN**. Which do you mean, in the lump sum?

Mr. **GALLOWAY**. No; over on the next page, the additional clerks asked for there. If additional money is given for extending the seed fund to be expended in the District of Columbia, that would obviate the necessity for this.

The **CHAIRMAN**. As I said yesterday, I think that seed appropriation ought to take care of itself. If you have a tremendous correspondence owing to that seed distribution, let that fund take care of it.

Mr. **GALLOWAY**. It is charged up in the statutory fund, but these clerks could then be detailed to the scientific force where they are urgently needed.

Representative **SCOTT**. Then I understand on page 5 where it reads four clerks it should read three?

Mr. **GALLOWAY**. Three, and it leaves the one at $1,800. That would be an increase of $300. With your permission, as Mr. Taylor, the assistant pomologist, is here, I will ask him to explain the work of his branch of the Bureau.

The **CHAIRMAN**. Very well.

STATEMENT OF WILLIAM A. TAYLOR, POMOLOGIST IN CHARGE OF FIELD INVESTIGATION.

The CHAIRMAN. We will take up page 14. The first little change in that is the telegraph, express, and freight charges. We understand that. There is no change in the language of the item. There is simply a change from $30,000 to $40,000, an increase of $10,000.

Mr. TAYLOR. Yes, sir.

The CHAIRMAN. Now, Mr. Taylor, we will be glad if you will kindly give the committee a general idea what the necessity of that raise is, and any interesting facts in connection with the pomological investigation you may choose to give.

Mr. TAYLOR. Possibly I can do that best, Mr. Chairman, by outlining briefly the work that we are engaged in at the present time, as we contemplate no radical new work, but simply an extension of the lines upon which we are already engaged. To make it concrete, I have prepared this brief analysis of our expenditures of the present appropriation.

I would say, first, that under pomological investigations the work is divided into two somewhat distinct groups. The first, the general investigations which are conducted and which center largely here in the city of Washington. These consist chiefly of work in the Department, within the Department buildings. We divide this into two parts—first, that which we designate as laboratory work, which includes the identification, description, and record of fruits received from growers; second, the illustration, modeling, preparation of herbarium specimens, and so on, as matters of permanent record; third, the descriptive catalogue of American fruits, upon which we have one man engaged.

To the laboratory branch of our work we devote $7,120 this year, as now estimated.

The CHAIRMAN. How much?

Mr. TAYLOR. $7,120 under our present working force. That is our allotment for that work this year. The second or administrative group, which includes the correspondence and the general routine work and the care of the rooms and buildings, and so on, messengers, charwomen, and helpers, we devote $5,400. Then to miscellaneous supplies and expenses, covering all miscellaneous items, including miscellaneous travel, we devote $2,150. These we group under the head of general investigations or expenditures in Washington.

The second group, of which I have personal charge——

The CHAIRMAN. How much is the total of that Washington expenditure?

Mr. TAYLOR. The total of the Washington expenditure is about $14,700.

The CHAIRMAN. It is pretty near half the sum?

Mr. TAYLOR. It is nearly half of the appropriation.

The CHAIRMAN. That $5,400 item—repeat that.

Mr. TAYLOR. Five thousand four hundred dollars is for administrative work. That includes the stenographic help and the general help about the office, and covers the entire expenditure for general correspondence, and those miscellaneous items of routine work, which are very heavy, in this line of investigation.

Perhaps I should say here, in explanation of this, that the heaviest burden of labor upon the office is the handling of the perishable material that reaches us during the fruit season. We have had this year about 4,000 different individual lots of material for inspection and to report upon to growers. We receive from growers in all parts of the country specimen fruits for identification, from men who have received fruits under wrong names from nurseries, or who have them under no name, and who desire to know what the thing is that they are growing. Unlike practically every other branch of the Bureau of Plant Industry, our specimens are perishable. We have refrigerators and can hold a moderate surplus over for a few days, but in general they must be attended to within forty-eight hours after receipt, so that we have a disproportionately heavy expenditure of time and energy, especially during the fruit season, which extends with us from the 1st of June through until about the 1st of January. We get not infrequently forty and sometimes a hundred lots a day through the mails from growers for identification, or of new fruits submitted for our opinion of their value. The originators sending them desire to submit them for an expert opinion before deciding whether to name and introduce them as new varieties. So that our correspondence work and our specimen work is exceedingly heavy, and can not be distributed throughout the year because of the perishable character of the specimens.

The CHAIRMAN. It comes in a rush only for a short time in the year, then?

Mr. TAYLOR. The rush of this work lasts for about six months in the year. We get the citric fruits from California and Florida. They are beginning to come in now; but the light receipts are chiefly from the 1st of January through until after the 1st of April, when the strawberries from the South begin coming; then they reach heavy receipts about the 1st of June, and through June, July, August, September, October, and November.

The CHAIRMAN. What are these receipts? What do they send them to you for particularly?

Mr. TAYLOR. Primarily for identification. The situation among growers is this—and this is not recent, but it is the accumulation of error that has been perpetuated or that has been originated in the past: The nurseries have in many cases sent out trees under incorrect names. In other cases the trees have gone out with correct names and the names have been lost. Now, a planter in Kansas or in Georgia or in New York finds that he has a certain tree or a certain lot of trees in his orchard of a variety which is succeeding very well with him. He does not know what that variety is. He wants an opinion——

The CHAIRMAN. He does not know it, owing to the loss of the tag on it, or something of that sort, coming from the nursery?

Mr. TAYLOR. Yes; or owing to the fact that it was incorrectly named when it came to him.

Representative GRAFF. Lots of them do sell them incorrectly in order to bring a bigger price.

The CHAIRMAN. That is true, and yet it is a queer state of affairs, that the Government should be asked to correct the mistakes of nurserymen.

Mr. TAYLOR. The grower has no redress against the nurseryman, and especially against the traveling tree salesman. The farmer is the man who is "up against it." He has that thing which he does not know and which he wants to plant more of; or, what is very frequently the case, he has a variety which he finds is absolutely unsuited to his conditions, and in ordering from the nursery for a new orchard he desires to avoid ordering that sort. He desires, therefore, to know what the variety is that does not succeed with him. He sends specimens for that purpose.

Then again, in many cases, especially in the newer country—and this is particularly true of the Rocky Mountain country and the Pacific coast—varieties have gone out from the East in former years, the names have been lost, and they appear here and there in orchards, and the growers believe them to be new sorts. Honest nurserymen, who desire to do the right thing by their customers, frequently are in doubt whether a variety that is succeeding in a particular orchard is a new thing, a new seedling that originated there, or is an old sort not recognized. We have a great deal of work just at present from Montana, Washington, Oregon, California, Colorado, Utah, and the mountain and coast States just in that line—the line of determining whether the thing that is supposed to be new, and which they propose to introduce and sell at a high price, is new or is an old variety.

Representative GRAFF. Give us an instance of some new variety of fruit about which there would be any reasonable difference of opinion.

Mr. TAYLOR. That usually occurs before the fruit is formally introduced to the public. The grower himself who owns the particular tree or the nurseryman who has secured the right to propagate and introduce stock from that particular tree sends the specimen to us to learn whether it is in fact a new thing or is recognized by us as an old thing in the East.

The CHAIRMAN. That seems legitimate, but it does not seem right that the Government should correct the errors and frauds perpetrated by nurserymen, for they are frauds.

Mr. TAYLOR. Some of them are frauds, some are mistakes, but it costs the planter, who has the thing and who has no redress, money if he can not get the information.

The CHAIRMAN. If I buy a short-horned steer instead of a Hereford I should think I could look to the man who sold it to me to correct the error, not the Government.

Mr. TAYLOR. Every nurseryman and seedsman includes in his catalogue a disclaimer of responsibility for losses further than the original cost of the article that he delivered. That is but a small part of the cost to the actual grower after he has brought his tree up to bearing age and finds it is untrue to name.

The CHAIRMAN. He probably grows the tree three or four years before he finds out it is not the fruit he supposed.

Mr. TAYLOR Frequently ten years; sometimes fifteen or twenty, as in the case of the slow-bearing varieties of the apple, and as is particularly the case in the new industry that is arising in the South—the pecan industry—where the tree is slow to come into bearing. The nurseryman may be out of existence and his nursery gone before the truth is disclosed.

A case in point in regard to a variety of uncertain identity at this time is now on in Missouri, and this week a committee of the State horticultural society of that State is tussling with the question as to whether a certain variety which has been introduced and bears a properly registered trade-mark name is or is not an old sort that has long been grown there. It is a case we have not had opportunity to investigate in the field, but we have had specimens submitted for decision, and we gave the committee of that society our advice. That is a case of this sort: A variety that has been for some time grown locally in northwestern Arkansas—

Representative GRAFF. A variety of what?

Mr. TAYLOR. A variety of apple which had been grown locally in northwestern Arkansas and southern Missouri, the Ozark region especially, it is asserted, has been renamed, and that new name protected by being registered as a trade-mark in the Patent Office, and the proprietors of the trade-mark threaten with suit for damages any nurseryman who catalogues the variety under that trade-marked name, although they might have had stock in their nurseries prior to the granting of the trade-mark. They may have had stock of that same thing in their nurseries before the proprietors of the trade-mark saw the variety.

Representative GRAFF. The trade-mark only protects the use of the name itself?

Mr. TAYLOR. Yes, sir.

Representative GRAFF. It does not reach the question of the variety of the fruit, does it?

Mr. TAYLOR. No, sir; but our growers buy their fruit trees by name.

Representative GRAFF. If a man had a tree or a variety of tree, it would not be an infringement of a trade-mark because he had that fruit or purchased it. It would only be the use of the trade-mark in connection with the fruit, would it not?

Mr. TAYLOR. Yes, sir; that is exactly the point. The proprietor of the trade-mark threatens with suit for damages any nurseryman who catalogues that same variety indicating that the variety is identical with his trade-marked variety.

Representative GRAFF. But the trade-mark is simply the protected thing, and so long as they did not use the trade-mark the sale of this variety would not be any infringement on the trade-mark?

Mr. TAYLOR. Not the sale of the variety under any other name than that trade-marked name.

Representative GRAFF. I can not see how the identification of that particular variety would have any bearing on the question of the trade-mark?

Mr. TAYLOR. It has a bearing in this way, that under the trade-mark name trees are sold at, we will say, $25 a hundred; under the other name they have long been selling for $12 a hundred; and the purchaser who desires to get that variety independently of the name under which it comes desires to know that he is getting that particular thing. Now, the proprietor of the trade-mark, we will say, asserts that his trade-marked thing is distinct from the old one. You have his assertion against the assertion of the propagator under the old name, and you have there a doubling of the price to the planter, who is in this case the consumer.

Representative GRAFF. You are attempting to find out whether there is the same variety which is being sold and comes from a different source, and whether or not it is, in fact, the same variety as that which this particular firm sells under its trade-mark?

Mr. TAYLOR. Yes; or which may come from the same source. In certain cases it does come from the same source and it is simply a question of the same thing under two names, one the old local name under which it was grown before and under which commercial orchards had been developed, and the other under a new trade-marked name.

Representative GRAFF. It seems to me, Professor, that is a question that is purely private, and if these parties who are the owners of this trade-mark desire to test that question, they could sue the other individuals for an infringement of their trade-mark. That would be a question that would have to be tried in court. You folks would not have any power to determine that question at all.

Representative COONEY. Does a trade-mark protect a man in the country and for farm purposes?

Representative GRAFF. The trade-mark is simply a designation of his own wares under a particular name or term. Now, then, the question of variety is only incidental. The question of the character of the fruit under which the trade-mark travels is only an incidental question, and the only public question that can be involved is the fact as to whether these people can procure the same variety under another name. That is the question I suppose that the farmers there want to find out.

Mr. TAYLOR. The question the farmers are interested in is this: To take the first case in which the trade-mark was applied to fruits, and in which there were quite large interests involved for a time, the Idaho pear.

A certain seedling pear tree stood in the town of Lewiston, in Idaho, on the grounds of the Widow Mulkey. That tree was bought by a nurseryman, who named the pear "Idaho" and registered that name, the first trade-mark for a fruit that was registered in this country. He advertised the Idaho pear. He advertised it widely, and it was very generally distributed throughout the country. Other nurserymen bought stock of it from him under his seal and propagated from it, and the pear became generally distributed through the nurseries as well as through the fruit-orchard regions. Now, the question arose at once in regard to the right of other nurserymen to sell trees that they had propagated from those trees which they had bought of that Idaho Pear Company. The Idaho Pear Company claimed that it was the sole proprietor of the name "Idaho" as applied to pears, and that no nurseryman who had propagated trees from trees that he bought of the Idaho company was entitled to sell those trees that he had himself propagated.

Representative SCOTT. Under that name?

Mr. TAYLOR. Under the name "Idaho." The Idaho Pear Company broke down and is reported to have lost some $30,000 in the operation through the device of a nurseryman, who, having secured his stock from the Idaho Pear Company under their seal, propagated it rapidly in Alabama and put out in his catalogue this entry: "Mulkey pear, same as Idaho;" simply adopting a new name, naming it in honor of the widow on whose place the original seedling tree stood. In that case it was found that the trade-mark did not prevent the competitor from selling the thing under any other name that he chose; but the public, meanwhile, were at sea. Here was the assertion of one nurseryman that the Mulkey pear, which he offered at, say, 50 cents a tree, was the same as the Idaho, which could only be had at $1 a tree. Here is the question for the planter: Shall he pay the $1 or shall he pay the 50 cents? Who shall decide whether those two pears are identical? That is practically what we are doing.

The CHAIRMAN. In a case like that was the Department brought in as an expert witness?

Mr. TAYLOR. No, sir; that was just about the time that the old Division of Pomology was formed; but in a number of instances since then, and in this particular instance to which I refer, the Missouri case, we are appealed to by growers to know whether those two things are identical. They have got the old sort. To make it perfectly plain, they have a sort which they have been growing for fifteen years in southern Missouri under a particular name. It is in all the nurseries around there.

Representative GRAFF. What is it called?

Mr. TAYLOR. It is called Gano, a variety that closely resembles Ben Davis, but is distinct from it. The alleged new sort is introduced under the name of Black Ben Davis, and the question with the planter is, Shall I pay two prices for Black Ben Davis or one price for Gano? Are they identical? That is the point he is interested in, and that is the point we are called upon to decide.

The **Chairman.** You are called upon as expert to decide?

Mr. **Taylor.** Yes, sir.

Representative **Graff.** When you decide that, you do not have to decide it for every man that writes you? When you decide it once, that does service for everybody who is interested?

Mr. **Taylor.** That is true; but I simply refer to that as a case which frequently arises. In many cases it is simply a question as to whether the particular nurseryman has furnished stock that is true to name and which the farmer has less opportunity to determine for himself.

The **Chairman.** It is no longer the farmer who raises fruit; it is absolutely the professional fruit grower.

Mr. **Taylor.** That is true in western New York and it is true in Missouri and Illinois.

The **Chairman.** It is getting true everywhere, is it not? It is a special branch of agriculture and is becoming more and more so.

Mr. **Taylor.** It is becoming true nearly everywhere.

The **Chairman.** I do not know of any good orchards that are being set out in my own country. For instance, I have given up every kind of fruit on my place. I can buy it better and cheaper than I can raise it. You can not buy vegetables cheaper, because the market gardener wants his vegetables large, and you get his Lima beans and his peas too old; but I have given up every species of fruit on my place. I have given up strawberries this year. That seems extraordinary, but it is true.

Mr. **Taylor.** That is true in many sections of the country where the fruit industry has been highly developed, but there still remains a great breadth of country where there are these individual farm orchards—orchards of 5 or 10 acres on an 80-acre farm.

The **Chairman.** I know of very few new orchards being set out in my country. The farmer practically sells nothing except from his apple orchard. Fruit growing is a special branch now, and needs a special knowledge to take care of it, which the average farmer has not.

Now go on with your second division of expenditures, Mr. Tay lor outside of the city of Washington.

Representative **Cooney.** Has this Missouri apple two names—the Black Ben Davis and the Gano?

Mr. **Taylor.** There are three names certainly applied to one thing, and whether or not that is identical with a fourth we are not yet decided. We have not had opportunity to study it in the field. We have observed it simply from the specimens as received here, and that is but one of several phases in fruit identification when there is close similarity, so that the laboratory and administrative work come into close touch with the field work, of necessity.

Representative **Graff.** How do you determine about a fruit? How do you determine about the flavor and such things as that?

Mr. **Taylor.** Flavor has to be determined by personal knowledge, by personal experience with the taste.

The **Chairman.** Just like a tea taster.

Mr. **Taylor.** Yes; it is the same as with tea or wine.

Representative **Graff.** You can not do it by any process of analysis?

Mr. **Taylor.** No; no method of analysis has been devised that will enable one to distinguish one variety of apple from another.

Representative HENRY. You find, do you not, Professor, that the same variety of apples in different sections vary in flavor?

Mr. TAYLOR. There is a wonderful variation; yes. Take the Baldwin apple, for instance. A Baldwin growing in the West is a very different apple from one grown in New England. It has a different flavor and a different appearance.

The CHAIRMAN. Suppose there was submitted to you, for information as to what apple it was, a Baldwin in the East and a Baldwin in the West. Suppose they were pared and a piece of the apple given to you; how would you tell?

Mr. TAYLOR. I would have to depend upon my personal acquaintance with that variety.

The CHAIRMAN. Suppose the apple was peeled and just a piece given to you of both apples. Could you tell then?

Mr. TAYLOR. I think I could as to certain varieties, Mr. Chairman, varieties with strongly marked flavors, but I would not undertake to do it with anything like the full number of apples that I know when I can see them. But these points come in every time: The modification of the form and color by climate. I wish we might have here a few samples of the facsimile models which we are making and accumulating, to give us light on just that point. We have the Ben Davis and the Baldwin, we will say, from 20 different States, grown under different conditions; and while the Ben Davis in Maine is an apple not much larger than a good-sized egg we get it in northwestern Arkansas up to the size and weight of 16 or 17 ounces. That modification of the fruits by climate is just the thing that puzzles the grower in the new orchard regions. The thing does not look as it did back in New England or New York, where he came from, and he is skeptical whether it is the same thing.

We were able in about 75 per cent of the specimens that have been submitted to us for identification this last year to make positive identification. In the other 25 per cent we are not able to do it. This is not through identification by any one man, because no one man knows all the varieties even of the apples that are grown commercially, nor can any one man know; but we have a session in which three or four trained men pass upon each specimen. We have a session each morning during the season when fruit receipts are large, in which we go over the specimens received on that day for identification and determine those that are plain cases. Those that are obscure or upon which there is a distinct difference of judgment on the part of individuals are reserved for further study and are compared with paintings that we make, illustrating the variety as it grows in different sections, with the models that we have and with descriptions both in print and manuscript, with a view to making an accurate determination of the specimens. We can not refer to a herbarium specimen and determine it there at some time three months hence, as the botanist can with a plant sent for the same purpose.

The CHAIRMAN. Now, your second division of expenditures.

Mr. TAYLOR. The second division we entitle "pomological field investigations." This covers five somewhat distinct lines of work. The first is our experimental export shipment work.

The CHAIRMAN. That is practically new, is it not? It has only been going on for the last few years?

Mr. TAYLOR. Yes, sir. All but one of these lines under the field investigation work are practically new. They are now in the second year of the work.

Experimental export shipments, on which we are expending this year about $6,000.

The fruit storage investigations, which we conduct in connection with the export shipment work, using the same men, but carefully allotting expenditures so that we can closely approximate what we are devoting to each. On this we expend a little over $6,000.

Representative SCOTT. Let me ask you right there——

The CHAIRMAN. Let him give the list, Mr. Scott, first, and then we can inquire about any one of them afterwards.

Representative SCOTT. I was going to ask him a question on the export shipment business.

The CHAIRMAN. Give the list, Professor, and then go back and explain the export shipment business.

Mr. TAYLOR. The viticultural investigations which relate to the effort to introduce European grapes in our Southern States, and under which we maintain two small testing stations in a cooperative way, one in North Carolina and one in Florida. On this work we are spending $1,200 this year.

On our fruit district investigations, in which we aim to map accurately and to determine by soils and by elevations the adaptability of commercial varieties to regions, we are expending $600. Then there are certain miscellaneous field problems on which we are spending small amounts, aggregating $1,200 this year.

If it is your pleasure, then, I will take up the export shipment question.

The CHAIRMAN. We should be glad to have you do that.

Mr. TAYLOR. In our export shipment work thus far, including two shipments which are now in transit, we have made about 35 export shipments since the 1st of July, beginning with summer apples in July, in Delaware; following that with peaches from Georgia and West Virginia and Connecticut; pears from New York, Delaware, and New Jersey; winter apples from New York and Delaware thus far, and with sweet potatoes from Virginia, Delaware, and New Jersey. The export work has been devoted, first, to an effort to determine whether certain perishable fruits that have not been shipped abroad from points east of the Rocky Mountains can be safely delivered in foreign markets; and second, to the effort to learn what packages are best adapted to such shipment.

I will take up the summer apple shipments from Delaware first. The judgment of the English fruit receivers was that summer apples from the United States could not be delivered in the United Kingdom in a sound condition. They believed there would be sale for them during July and August in the London market if they could be delivered; but in an inverview with one of the largest receivers in Europe of American fruits he expressed to me on the 4th day of July the opinion that it was impossible to deliver our perishable summer varieties.

The CHAIRMAN. What we call the Harvest apple?

Mr. TAYLOR. The Harvest apple, Red Astrachans and varieties of that type, and Yellow Transparent. We made four shipments in successive weeks from central Delaware, securing fruit from a number of individual growers, and arranging to have it packed in one packing-house, so as to secure uniformity of grade and pack, which is a very important point in the fruit export trade.

The result of four shipments was that three of them landed in practically perfect condition and sold in London for phenomenally large prices, even yielding a higher net price per bushel of fruit back in Delaware than they were receiving in the New York and Philadelphia markets for the same kinds of fruit from the same farm, and this notwithstanding the fact that all of our shipments were made in a retail way and were subject to express charges for transportation instead of to carload rates.

Representative HENRY. There was no loss to the Government, you say, on these early apple shipments?

Mr. TAYLOR. On three of those there were—not with most of the varieties, outside of the expense of salary and travel in connection with the shipments.

Representative HENRY. I did not mean to include that.

The CHAIRMAN. Just tell us how you shipped these things—exactly the process.

Mr. TAYLOR. To ship them we sent a man first into the orchards in Delaware. I would say, if I may enlarge upon it a little, that summer apple shipment in that State has been entirely on a basket basis heretofore. The apples have not been packed in barrels or boxes. They have been packed simply in peach baskets, often without cover, and shipped not farther than New York City. Little effort at grading or systematic packing or wrapping has been made in that region, and it was necessary to first locate orchards in which there was fruit suitable for export, then to arrange with the grower to deliver a definite quantity of a certain variety at a certain packing house near the railroad station on a certain Monday, that fruit to be assorted at the packing house and packed under the direction of our experts and forwarded to New York by express for refrigeration on the steamer. Previous to this it was necessary to arrange for refrigeration on the steamer, and we met our first obstacle there. The fast steamers for London, while they have refrigerated compartments, are under contract not to permit the transportation of fruit in those compartments for other shippers than those who hold the contracts. Those contracts run for about one year yet.

The CHAIRMAN. They are beef contracts mostly?

Mr. TAYLOR. Yes, sir. Those contracts are made for a number of years. So we were compelled to depend upon the courtesy of the steamship employees and of the meat men who had the contract for the privilege of service in the ship's box, which is not a satisfactory, and would not be a commercial, refrigerated service for fruits. We were therefore compelled to go for our later shipments to the slower boats, in which we could secure refrigeration in quantity at a retail rate for small lots, or at carload rate for carload lots when we reached that stage in our shipments.

The result on this first shipment, which left New York on July 9, was as follows: On the five varieties we tested Early Colton, packed in the Georgia six-basket peach carrier, a package that has not been previously used for apples, so far as we know, but which appeared to us suited to the requirements of perishable summer fruits, netted at the shipping station, after all expenses of transportation, packing, and wrapping paper were out, $1.12 for the 3 pecks of fruit that were in the carrier.

The CHAIRMAN. How much is that in bushels or in pounds?

Mr. TAYLOR. That would be, in bushels, approximately $1.41.

The CHAIRMAN. A bushel?

Mr. TAYLOR. A bushel.

The CHAIRMAN. The quantity was what?

Mr. TAYLOR. The quantity was 3 pecks; $1.12 for the 3 pecks in the package.

Representative HENRY. They are put up in a crate, are they not?

Mr. TAYLOR. Yes, sir; the identical package that is used for Georgia peaches.

Another variety, Early Ripe, of equal appearance, so far as we could judge, netted but 43 cents, against the $1.12 for Colton. Early Ripes are largely grown in Delaware, and would have been one of the first varieties taken up in the export trade but for these tests. The Early Ripe evidently does not suit the English buyer, judging from this test and the others we made.

Yellow Transparent, the variety which the largest receiver of American fruits in the United Kingdom told me could not be delivered in England in sound condition, netted at the shipping point $1.70 a carrier—over $2.25 a bushel—and this was repeated in subsequent shipments; so we feel satisfied the receivers are not informed as to all the possibilities regarding the export trade.

Red Astrachans netted 82 cents per carrier, and Summer Rose, a small light-colored variety grown in that region, netted 88 cents.

I have a somewhat complete report from our receiver upon this, which I will not read, but I would like to read their final comment on the summer apples which they wrote on receipt of our shipment of July 23:

> We regret to hear that probably you will not be sending any more summer apples this season. * * * In one of our previous letters we wrote as regards the necessity of the apples being packed tight, so as to prevent shifting and bruising en route, and this is a point that you can not impress too strongly on the shippers.

In their last report they say:

> The apples were in first-class order, especially the Randolphs.

That is a variety very widely grown in Delaware, and evidently particularly adapted to export shipments.

The CHAIRMAN. They must be a hard, firm apple.

Mr. TAYLOR. Yes, sir.

The CHAIRMAN. Is it a summer apple, a harvest apple?

Mr. TAYLOR. Yes, sir; and this brings up the question of identification also. This particular sort was introduced by the late Randolph Peters, of Wilmington, Del., one of the wholesale nurserymen of twenty years ago, under the name "Unknown." It was catalogued by him under that name and widely distributed. It reaches us from Arkansas and other points under the name "Unknown." This is the apple which is now found especially adapted to the export trade, and one which but for our experience in the identification work in former years we would have been obliged to take up anew.

Representative GRAFF. It would be unknown to you?

Mr. TAYLOR. Yes, sir; it would be unknown to us.

Representative HENRY. What was the result of the Baldwins? You made a shipment of the Baldwins, did you not?

Mr. TAYLOR. Yes; if you will permit me I will take that up later.

Representative HENRY. Certainly.

Mr. TAYLOR. I would like to discuss the winter apples all at one time. They proceed:

> Although these are not so highly colored as the "Strawberries," they appeared of a firmer texture and less likely to bruise. You may rest assured they will be appreciated here on our side. We are sorry that there are no similar ones now coming forward, as the demand at present is good.

This exceeded our anticipations, for the reason that our efforts with the summer apples was based on the belief that the London market is bare of good apples only during the month of July. The Australasian fruit—that from Australia, Tasmania, and New Zealand—which is picked from the tree in March and April and reaches London about thirty-seven to forty days later, is practically out of the market by the 1st of July.

The CHAIRMAN. That fruit is sent in refrigerators?

Mr. TAYLOR. Yes, sir; entirely so. The only fruit with which ours would come in competition during the month of July would be some nondescript fruit received from Spain and Portugal, known in the London markets as Oporto fruit, and we did not anticipate that after the 1st of August we could get prices that would justify us in paying refrigerator bills and express charges on these shipments in a small way, but our last shipment yielded practically as high a net return as the first.

The CHAIRMAN. What time did it leave?

Mr. TAYLOR. It left New York on the 2d of August on a slow boat, and was sold in London on August 15.

The CHAIRMAN. As a result of that experience with the summer apples, how much further do you want to go in that business?

Mr. TAYLOR. We desire this coming year to take up the question of the package more definitely. The carrier, there is no question, will deliver any summer apple in sound condition in London with refrigeration. It is, however, a much more bulky package in proportion to its contents than a box, in which every inch of space is occupied, and the box is at the same time a stronger package relatively than the carrier. The box is an economical package in point of first cost, as all ocean freight is based upon bulk, and as refrigeration costs more than common storage, the question of the bulk of the shipment is a very important one in determining the cost of delivering in London. So we desire to take that question through in smaller boxes than we tried this year. We compared bushel boxes in some shipments with carriers, but we are satisfied the bushel box is too large for best results with these tender summer fruits.

Representative SCOTT. The $6,000 which you spent this year in this business represented, then, a loss commercially in the shipments?

Mr. TAYLOR. No, sir; begging your pardon. The larger part of this $6,000 represents our expenses in travel and the subsistence of our men who are supervising this work.

Mr. GALLOWAY. Salaries.

Mr. TAYLOR. And their salaries also in proportion to the time they spent on this work.

Representative HENRY. Do you regard your experiments as regards refrigeration completed?

Mr. TAYLOR. The storage of fruit?

Representative HENRY. Yes.

Mr. TAYLOR. No, sir; I will come to that a little later.

Representative HENRY. Summer fruit, I mean.

Mr. TAYLOR. No, sir. We are satisfied that there is a demand for summer apples in London at a profitable figure, and now the question remains, What is the most economical way of packing and forwarding?

The CHAIRMAN. You have reached that point, then, when you would be willing to advise the American apple grower to engage in the business, when you are willing to say to him that there is a profit in it to him, properly packed and managed?

Mr. TAYLOR. Where he has a sufficient volume of suitable fruit so that he can pack an even grade, or where several smaller growers can consolidate their product and pack together for shipment. It must come down to a carload basis in order to reach commercial success, because the carload rate by rail and boat is the key to the situation.

The CHAIRMAN. Your only question aside from that thing is the packing cases, that you are investigating?

Mr. TAYLOR. Yes. I would say that in our judgment this means this also, that much of the country that we have been considering not adapted to apples—I refer especially to the tidewater region of the Atlantic slope south of Baltimore—is eminently capable of marketing apples abroad, and fits into the time when the market needs the fruit. It does not compete with our Northern fruit. Our hold-over fruit is out of the way and we are able to grow beautiful summer apples in large quantities; so that it means to them another crop, practically, where they are on railroads that give them quick transit to seaboard and can produce enough to make shipments.

The CHAIRMAN. I do not believe that business could ever be engaged in by the grower himself. It has to be engaged in by a shipper who buys them for export.

Mr. TAYLOR. Except in a cooperative way, though there are many apple orchardists who ship a carload a day, and it would not be at all an impossible proposition in that respect.

The CHAIRMAN. About selling on the other side—the man who ships a carload a day and ships it through New York, sends it right to a commission firm, does he not?

Mr. TAYLOR. Or fruit auction; yes, sir. This fruit, I should have said, was put up at auction and sold on its merits, lot by lot, with the distinct instruction that it was to be sampled, packages were to be opened, and in the case of many of these shipments a package was dumped for inspection of the buyers, so that the price, as nearly as we can get at it, is the financial judgment of the English buyer on the article for his trade.

Representative WILLIAMS. What sort of experience did you have with your sweet potatoes?

The CHAIRMAN. Let him take up his winter apples next.

Representative COONEY. Are the English buyers of the opinion that the shipment of summer fruit over there is impracticable?

Mr. TAYLOR. No, sir; not at present. That was their belief in the beginning, before we undertook it, but they changed their views on this point as the result of those shipments.

The CHAIRMAN. I think at the very best it would be a very risky sort of business.

Mr. TAYLOR. It is, and yet with the perishable fruits that are going from Australia to London it is not impossible or impracticable.

The CHAIRMAN. I do not think it is impossible: but it is pretty risky. There are a good many chances in it. In fact, the fruit business generally is a pretty risky business.

Mr. TAYLOR. There is risk in it, but the risk is reduced as it is systematized, and as we come to know better the requirements of the trade.

Now, I will pass, with your permission, to our peach shipments for this year.

The CHAIRMAN. You have not touched winter apples, have you?

Mr. TAYLOR. No, sir. If you prefer to have those taken up now I may just as well do that.

Our winter work, in so far as we have returns that we can report on, began with the shipment of a carload of apples from central and southern Illinois in August. The reason for this shipment was this: There was an epidemic of bitter rot in that section, and the question of how far it would reduce the value of the crop in that immediate region was up. One of the largest handlers of apples in this country offered us a carload or two carloads to do with as we pleased at his risk, in determining whether early picked winter apples in that region——

The CHAIRMAN. Picked in August?

Mr. TAYLOR. Picked in August, picked before the 15th of August—could be safely exported, and in that way the fruit be withdrawn from the orchard and withdrawn from danger of destruction and marketed at a price that would pay for the cost of handling. The carload was at that time in transit to Chicago. They did not dare to leave the fruit on the trees. We diverted it from Chicago and placed it on a steamer from New York, a slow boat, the fruit going in common stowage, the cheapest form of shipment.

Representative HENRY. In paper?

Mr. TAYLOR. No, sir; unwrapped. They were Ben Davis and Winesap apples, and we made the shipment for auction sale in London. It left New York on the 30th of August and was sold in London about September 10. They were in the carload 167 barrels, of which 162 were Ben Davis; 120 of these were No. 1 Ben Davis and 42 were No. 2 Ben Davis. The Ben Davis averaged on the London market $5.06 a barrel, the gross price. The Winesap, all of which were No. 1, averaged $5.32. The net value at the shipping station at Xenia, Ill., of the Ben Davis was $3.12 a barrel. The net value of the Winesaps was $3.36 a barrel.

The CHAIRMAN. So you had about $2 leeway. Is that what you mean?

Mr. TAYLOR. As to cost of transportation; yes, sir.

The CHAIRMAN. To cover the cost of risks, etc.?

Mr. TAYLOR. Yes; but the principal point of interest to us and to the grower and to the dealer at that time was the fact that the consignees called for more, and they were gratified by the receipt of shipments that followed immediately from the West to London.

Representative GRAFF. Do I understand that the shipment was a profitable shipment from a commercial standpoint?

Mr. TAYLOR. This shipment netted at the shipping station at least 50 per cent advance over the home value at that time on that grade of fruit.

The CHAIRMAN. Three dollars and twelve cents was not the value at the shipping point?

Mr. TAYLOR. No, sir; that was the actual net.

The CHAIRMAN. What was the actual market value at the shipping station?

Mr. TAYLOR. The actual market value was about $2 on the No. 1 Ben Davis at that time.

The CHAIRMAN. Then it was a profitable shipment?

Mr. TAYLOR. It was a profitable shipment, and it brought out this point, that it is possible, at least when the emergency makes it necessary, to begin the shipments of Western grown winter apples a month earlier than we have been doing.

Representative GRAFF. And there was a demand for more?

Mr. TAYLOR. There was a demand for more fruit of that character on the other side. The explanation of it probably is that while it was hard when picked, as it went in common freight cars and on a slow boat it ripened in transit.

The CHAIRMAN. It was right in the heat of summer, too?

Mr. **Taylor**. In the heat of summer, although the fruit was fairly well colored and fit for sale and use.

The **Chairman**. I understood you to say the Winesaps sold for less in London than the Ben Davis?

Mr. **Taylor**. No, sir; the Winesap sold for $5.32 a barrel, and the Ben Davis for $5.06. The comment of the consignees was this:

> We have much pleasure in advising you that the fruit arrived in splendid condition, and we hope that the realization is such as to induce further shipments. * * * Although the apples had ripened considerably, still they somewhat lacked the red color necessary for Ben Davis. Had they been more satisfactory in this respect, prices would have been higher.

Hitherto export shipments of apples from that section of these important commercial varieties have not been made earlier than the middle of September, and frequently not until later than that.

Representative **Cooney**. How much profit did the Government make out of that shipment?

Mr. **Taylor**. Nothing, sir. We assumed no risk and we made no profit. That shipment cost us two telegrams from Chicago to New York, 167 of our export labels to attach to the barrels, and a 10-cent stamp to insure immediate delivery of those labels in New York; but it is not often that we find a grower or a dealer who is willing to assume the risk on a thing that has not been tried, and therefore we can not always do it in that way.

Representative **Cooney**. The Government, then, or the Department, assumed the risk?

Mr. **Taylor**. In the case of perishable goods, like the summer apples, we assumed the risk.

Representative **Cooney**. In this case you are talking about?

Mr. **Taylor**. No, sir; the dealer assumed the risk entirely. He placed that carload in my hands and said, "Do what you please with it."

Representative **Cooney**. Who is the dealer?

Mr. **Taylor**. F. Newhall & Sons, of Chicago. The question at issue was this: Does the Englishman like a hard apple in summer or fall? We know he does like a hard apple in winter. That is one of the reasons why our pippins bring so much higher prices than our other sorts.

Representative **Scott**. If the dealer assumed all the risk of the shipment, what object did he have in putting it in your hands?

Mr. **Taylor**. Because, according to his statement, he did not know how to do it and did not have time to take hold of it. He was not used to exporting at that time of year and had not his machinery in operation. We handled it through our London consignees, and instructed them to make careful examination of the stock to determine its condition, for that was one of the important points, and we in that way had the results for the public good.

Representative **Graff**. The dealer offered it in the same spirit in which you were trying the experiment yourself, for the benefit of the public in general?

Mr. **Taylor**. Yes, sir.

Representative **Graff**. That is to say, he regarded it as an experiment himself?

Mr. **Taylor**. He regarded it as a very doubtful experiment, but the outcome of it was profitable to him in that case.

On our later winter-apple work we have taken up the question, first, of the package for apples in export. There has been much discussion as to the relative merit of the barrel and the box as packages for export. There has been little careful test work done on this. We know that boxed apples in general sell for much higher prices than barreled apples, but it is true almost without exception that the boxed apples are of much higher grade than the barreled apples, so that the actual question of which is the better package for the ordinary grower and for the bulk of the crop is one that we feel needs to be settled by careful test.

We secured in western New York a carload of Baldwins and in Delaware a carload of Winesaps. We arranged to make duplicate shipments of these to London, Liverpool, Glasgow, and Hamburg, the shipments to leave New York on the same day, the steamers for the four ports starting within a few hours of each other. Each shipment was packed so that equal quantities of fruit went in barrels and in 40-pound boxes. Half of the boxes in each lot and half of the barrels in each lot were packed with fruit wrapped with paper, the object being to get a careful comparative test of the selling value of a given bulk of apples in barrels and boxes, both wrapped and unwrapped, in the four markets at once, or as nearly at once as was practicable. I have not the detailed account of the sales of those shipments, but I have the cabled New York nets on them, and they may be of interest to you. These are as follows: This fruit was practically identical throughout each shipment, a straight No. 1 Niagara County Baldwin and a straight No. 1 Kent County, Delaware, Winesap.

Representative **Cooney**. Let me ask you there, Professor, were the barrels the same weight as the boxes?

Mr. **Taylor**. No, sir; the barrels net—well, the shipping gross of the barrel is 160 pounds and of the box 40 pounds. One barrel is equivalent, approximately, to four of these boxes in its capacity. In the London markets the Baldwin barrels of wrapped fruit netted $2.43 back in New York. The barrels of unwrapped fruit netted $2.48. The unwrapped fruit brought more money on Baldwins. On Winesaps the wrapped fruit brought $2.52 a barrel; the unwrapped fruit $2.23 a barrel.

The **Chairman**. You speak of net prices now at New York?

Mr. **Taylor**. Net prices at New York.

The **Chairman**. With all the freight charges taken out?

Mr. **Taylor**. All freight, commission, and export charges are out In that case the Baldwins brought more money without wrappers. It cost about 25 cents a barrel for the paper and labor in wrapping. Money spent in wrapping Baldwins for London would have been wasted.

Representative **Henry**. How do you account for that?

Mr. **Taylor**. I have a letter just received from the consignee in which he states as follows:

> The fruit of this consignment was good throughout, but the unwrapped barrels were by far the more salable. The apples in boxes, either with or without paper, do not suit the trade here.

Glasgow reports (I read this, as it applies in response to the question):

> We would say, however, that the public is not in favor of any of the apples being wrapped. The reasons for this are that they can not see the fruit so easily, and that every package that is wrapped is of lighter weight than those that are unwrapped. At the same time, both could be made to look inviting if something were done with the boxes after the Californian style, and the barrels might be made to look better when they open by having a sheet of paper against the lid of the barrel, not the pressed end.

But the point is that on Winesaps they paid more money for fruit in wrappers.

The CHAIRMAN. Why is the apple lighter when wrapped?

Mr. TAYLOR. Because you can not get as many apples into a barrel.

The CHAIRMAN. Is there enough paper to interfere with that?

Mr. TAYLOR. Yes, sir.

The CHAIRMAN. I would not have thought that.

Mr. TAYLOR. In some tests I made in Michigan in August, for storage, wrappers reduced the actual weight of fruit in the barrel by from 10 to 25 and in some cases 30 pounds, and that is of course a point for the shipper to consider. But the point is this: They paid more money for the wrapped Winesaps and less money for the wrapped Baldwins.

In London the wrapped boxes of Baldwins netted 73 cents, the unwrapped boxes 84 cents—just the same as in the barrels. For Winesaps, the wrapped boxes brought 87 cents and the unwrapped boxes 76 cents—the same rule of more money for wrapped fruit of this variety.

The Liverpool sales netted $2 for barrels of wrapped Baldwins, $1.84 for barrels of unwrapped Baldwins; for Winesaps, $2.58 for wrapped barrels, $2.48 for unwrapped barrels—a slight difference in favor of the wrapper, but not enough to pay for the cost of wrapping.

In boxes the wrapped Baldwins brought 57 cents; the unwrapped, 48 cents. In Winesaps the wrapped boxes brought 57 cents; the unwrapped, 52 cents. There both the varieties netted somewhat more for wrapped fruit, but not enough more to pay for the cost.

For Glasgow the wrapped barrels of Baldwins sold netted $2.67; the unwrapped, $2.85—the "naked" fruit, as they term it, bringing more money.

For the Winesaps, however, to the contrary, wrapped fruit brought $2.88 a barrel; unwrapped fruit, $2.17.

Representative HENRY. How do you explain that?

Mr. TAYLOR. I do not explain it at all, except possibly in this way, that the Winesap crop this year is very short. The apple crop south of the Potomac River is light, and that is the great Winesap region for export.

Representative HENRY. That does not explain the reason why the wrapped fruits should bring more.

Mr. TAYLOR. Only that the Winesaps were probably sought by dealers in fancy fruits who desired to have them to suit their trade.

Representative SCOTT. Mr. Henry is trying to find out why the wrapped fruit sold for more than the unwrapped fruit?

Mr. TAYLOR. We have only the comment of the sellers, that their buyers prefer to see the apples they are buying and not to buy them in wrappers.

Representative SCOTT. That would account for it if the facts were the other way, but the figures you have just read there show that they paid more in Glasgow for the wrapped fruit than they did for the unwrapped fruit.

Mr. TAYLOR. That was for the Winesaps; but for the Baldwins they paid more for the unwrapped.

Representative HENRY. Why the distinction between the two varieties?

Mr. TAYLOR. The only reason for it that we can see is that the Winesap crop is very short and that the Winesaps are therefore more likely to be taken for a particular fancy trade, and that the buyers of Winesaps are also more used to getting Winesaps in wrappers, for the Oregon Winesaps, which do go abroad in boxes, are frequently wrapped.

Representative COONEY. There were different purchasers also, I presume?

Representative GRAFF. They were sold to a different class of trade?

Mr. TAYLOR. Yes, sir.

Representative GRAFF. Different tastes might have had something to do with it?

Mr. TAYLOR. Yes, sir.

For Hamburg we had not a sufficient quantity of Winesaps to send. The orchard ran short, and the Hamburg receiver, contrary to our instructions, held the fruit a week to await a better market, so that the Hamburg nets on Baldwins in barrels were $4.15 for the wrapped fruit, in contrast with $2 for Liverpool on the same grade of fruit, and for unwrapped fruit $3.80. There is a margin of 35 cents a barrel in favor of the wrapper on Baldwins in barrels in Hamburg.

In boxes the wrapped fruit netted $1.23 and unwrapped fruit $1.06.

These results are very discordant. They are too discordant to be interpreted under any one interpretation, and it emphasizes the necessity, in our judgment, of having this whole business on the other side seen through American eyes and reported on through an American.

Representative GRAFF. Does not the price of apples and all fruits vary a great deal?

Mr. TAYLOR. Yes, sir.

The CHAIRMAN. You might have struck a bad day or a good day?

Mr. TAYLOR. In so far as comparisons of these markets are concerned, one shipment would not throw any particular light on it.

The CHAIRMAN. Fifty shipments would not?

Mr. TAYLOR. The main thing to get at is what are the preferences of the buyers in those markets as regards the package.

Representative SCOTT. Did these experiments throw any light on the preference for the box or barrel?

Mr. TAYLOR. It showed in the case of Hamburg a distinct preference for the box. That is, there is more money in four boxes of wrapped apples at $1.23 net than there is in the same quantity of fruit in a barrel at $4.15. There is about $5 for the fruit in four boxes as against $4.16 for the same fruit in the barrel.

Representative SCOTT. How was it in the other markets?

Mr. TAYLOR. In Liverpool there was very little difference; and when you come to figure the relative cost, the labor cost of packing in boxes in comparison with that of packing in barrels, these Liverpool sales would leave, I think, a larger net for the barrel than for the box; but there are certain things we are not satisfied with on the other side. The receivers say, in Liverpool especially, that red apples will not sell well in boxes. When we refer them to Oregon red apples they say, "Yes; that is so; they do sell; but Eastern red apples will not sell in boxes." It does not appear to us to be founded upon reason, and we desire to investigate that matter further. We need to see the actual conditions there and to study where this fruit goes from the seller, how long it is held before it is used, and what classes of people are using it on the other side, for those are questions that affect the future of our fruit trade very distinctly.

The shipment of winter apples this year abroad have been to date about four times the shipments of last year. The amount up to last Saturday was something over 800,000 barrels from America. That includes the Canadian ports.

Representative GRAFF. Do you get many inquiries about the results of these investigations regarding apples, for instance?

Mr. TAYLOR. Yes, sir.

Representative GRAFF. From people interested in this country in their export?

Mr. **Taylor.** Yes, sir; though this winter-apple work we have said very little about, for the reason that it needs to be duplicated and extended before we can be at all safe in giving the details.

Representative **Graff.** How long have you been investigating the subject of the export of apples?

Mr. **Taylor.** Of winter apples our first shipment was that August shipment from Illinois.

Representative **Graff.** And of summer apples?

Mr. **Taylor.** Of summer apples we began the 1st of July.

Representative **Graff.** So you would not have had time now to see any effect on it so far as the export is concerned in this country?

Mr. **Taylor.** Not in the case of winter apples; no, sir.

The **Chairman.** Just briefly, Mr. Taylor, what are the points you feel are undetermined yet by your experiments?

Mr. **Taylor.** In relation to winter apples?

The **Chairman.** Yes. As to summer apples you state that practically the only point left is the manner of packing.

Mr. **Taylor.** The manner of packing and the forwarding in relatively large lots—that is, carload lots; also the testing of other markets than London for this class of fruit.

The **Chairman.** In winter apples, summarize the points undetermined by your experiments.

Mr. **Taylor.** There are a number of undetermined points. In fact, this is but a preliminary view of what the situation is—this whole question of the box versus the barrel.

The **Chairman.** That is one.

Mr. **Taylor.** It must be worked out on a commercial basis.

The **Chairman.** Yes.

Mr. **Taylor.** We have got to know what the relative cost is of packing in boxes versus packing in barrels, the relative cost of the packages to take the same quantity of fruit, the proportion of fruit that can be packed in boxes. You can pack anything in barrels, because you can pack round things into round packages, but when it comes to putting round pegs into square holes it is quite a different matter, and the packing of boxes is more expensive. Then there is the question of the size of the package and of so influencing the trade that some uniformity in grades and packages can be secured. Our Canadian friends are far in advance of us in their attention to the export apple business, and it is telling in their favor in the markets on the other side.

The **Chairman.** Why do not our people imitate them? Imitation is pretty easy.

Mr. **Taylor.** Most of our people do not know what the Canadians are doing. The Canadian government is holding an inspection on each wharf, so that if a particular lot goes abroad with the name "Canadian" the buyer knows what stock is in it. The Canadian government also exercises supervision over the refrigerator service of the ships sailing from their ports. This careful supervision of the Canadian export trade in fruits is having a marked effect on the standing of those fruits in foreign markets, and appears likely to duplicate their recent experience along similar lines with cheese and dairy products. Everything goes from here, and they are in that respect far in advance of us. Some form of supervision appears necessary if we are to hold our own in this trade.

The question of the varieties best adapted to the several markets is still entirely open, and that is a very important question, especially as it relates to those varieties of which we have in sight a large surplus, such varieties as Ben Davis. The great orchard regions of the West now have a large proportion of trees of that variety. The question of which market will take these varieties best is entirely an unsettled question. We have been struck by our results on Kieffer pear in that connection. Certain markets take the Kieffer at prices that yield a good net return to the grower here, and other markets barely pay the cost of transportation for the identical fruit at the same time, because the preference of the consumer in that market is for another pear and against the Kieffer.

Now, our peach work. I might hastily review that. It was taken up from Georgia——

Representative HENRY. Has Professor Powell been in charge of the apple exportation as well as the exportation of peaches?

Mr. TAYLOR. The work is divided in this way: I have personal charge of the fruit-shipment work and Mr. Powell has personal charge of the fruit-storage work. In order to economize time and traveling expenses and salary, we divide up, and I do certain storage work in a region where I am arranging shipments and he does certain shipment work where he is arranging storage. So he is at work on both problems part of the time and I am at work part of the time. So we are closely associated all through.

Representative HENRY. He is working under your supervision, I understand?

Mr. TAYLOR. Yes, sir; I have general charge.

Representative HENRY. Yes; I supposed so.

Mr. TAYLOR. We undertook, in cooperation with one of Mr. Henry's constituents—I think Mr. Hale, of Connecticut, and Georgia—some cooperative shipments of peaches from Fort Valley, Ga., in July, to test the practicability of delivering Elbertas in marketable condition in London. To secure refrigeration on our first shipment we were compelled to accept the courtesy of the American Line Steamship Company and put our fruit in the steward's refrigerator, a shipment of 50 of the Georgia carriers. For the later shipments we secured space in commercial compartments on the boats of the Atlantic Transport Company, and therefore had more uniform temperatures and better results for that reason. We made three shipments of peaches from Georgia. Two of them were transferred direct from the iced car in New York to the steamship refrigerator, the third was of peaches that had been shipped from Georgia to Jersey City, stored in a cold-storage house for five or six days, then withdrawn and transported across the ferry to the steamer and forwarded in refrigeration, so that we had in that case a test of the practicability of exporting peaches that had been held in storage at the point of export to await the sailing of the steamer, which is very important on long-distance shipments.

The CHAIRMAN. It would be hard to time their arrival.

Mr. TAYLOR. It is impossible to time it exactly.

Representative HENRY. Did you find that third shipment equally profitable with the other two?

Mr. TAYLOR. It was the most profitable shipment we made to the other side.

Representative HENRY. It was a question of supply and demand?

Mr. TAYLOR. Of supply and demand.

Representative HENRY. It had nothing to do with taking it out of storage and putting it back again?

Mr. TAYLOR. The question was whether it was practicable to do that, because the transfer across the river in the heat of summer and the effect of the warming up of the fruit between the storage house and the steamer is important in commercial shipments.

The net values of these three shipments were as follows: The first shipment, which left Fort Valley, Ga., on Saturday, July 19, and which left New York on July 23, was sold in London on August 1 at an average price of $2.23, netted in New York $1.19 per carrier. That was a shipment of commercial unwrapped fruit, just as it had been packed for the New York market.

The second shipment, which left New York Saturday, July 26, went on a slow boat in refrigeration and was also of unwrapped fruit. It netted for one grade $1.29 a carrier and for the higher grade $2.02. The average New York value on this date of both grades of fruit was $1.86 per carrier, as determined by the sales there of the remainder of the same carload. That was $1.86 average New York value against $1.81 average New York net from London on both grades of fruit. The New York market value was $1.86 as against $1.81 for the New York value of the exported fruit, so that there is averaged just about even on that shipment.

The third shipment, which left New York on Saturday, August 2, and was sold August 13 in London, netted $2.36 in New York, against $1.86 New York value of the fruit out of the same car that was sold in New York.

So that on the Georgia fruit there was no manifest average profit on these three shipments, but this fact was established—that it is possible to handle this fruit in the export trade in a year when the conditions are favorable in the orchard, as they were this year——

The CHAIRMAN. To handle the surplus, in other words?

Mr. TAYLOR. To handle peaches from Georgia to London in a commercial way. Only four carriers out of the three lots were reported as damaged.

Representative HENRY. Right there, Mr. Taylor. Out of one of those shipments—I think the second shipment—Mr. Hale sent a carrier of those peaches identical with those that were shipped, unwrapped, in the package taken from the shipment, up to Hartford and put it in cold storage with orders to his local agent there to deliver it to me the day the fruit reached London. It came in excellent condition and perfect flavor and the peaches placed in a refrigerator were kept for two weeks. I had them on my table for two weeks following.

Mr. TAYLOR. We think we have established beyond any question that with conditions such as they were this year in Georgia, Georgia peaches can be laid down in London in sound and merchantable condition.

Representative HENRY. They were in all respects equal to the peaches Mr. Hale was selling every day through the Hartford market.

Mr. TAYLOR. It is now merely a question of what the home value is. If the home value drops below $1.50 per carrier, New York value, the exportation can go on with a fair chance of profit.

We continued these shipments from Connecticut, as we were able through Mr. Hale's cooperation; and I would say that he, as an individual, generously gave up his packing houses and his force of men, and contributed largely to the success of the experiment. We could not have conducted the test in any other place in the East without large expense.

Representative HENRY. I was present during the packing two days.

Mr. TAYLOR. We made a shipment of 200 carriers of Connecticut Elbertes from New York on September 13, which was sold September

24, that netted back at New York $2 for the average wrapped fruit and $1.67 for the unwrapped fruit in identical packages. It cost about 10 cents a carrier to wrap, so that there was a margin of 23 cents profit in favor of the wrapper on that shipment. The home value in Connecticut at that time was, as Mr. Hale figured it, $1.75 per carrier. The Connecticut net of the shipment was slightly above the home value.

The second and larger shipment from Connecticut, which was made on September 20, netted $1.67 back in New York for the wrapped carriers, $1.61 for the unwrapped carriers, and $1.25 for the 20-pound boxes.

By that time we had reached the conclusion that the carrier was too bulky a package for best economy in shipment. We need a more compact package if the peach export work is to be developed. We had at hand some of the 20-pound pear boxes, that we had been using in our Bartlett pear shipment, and we used some of these in this peach shipment. The nets on these with wrappers were $1.25, and they were just about half the capacity of the carriers; so that fruit that netted in the carrier $1.67 netted in the boxes $2.50, and the receivers report that the box is much preferred by their customers. So that that question of the particular package is still unsettled.

The CHAIRMAN. I should think that was settled.

Representative HENRY. What is your inference?

Mr. TAYLOR. Our inference is that the box is the more promising package.

Representative HENRY. What have you to say with regard to the refrigeration? Have you determined the last word in regard to that?

Mr. TAYLOR. No, sir.

Representative HENRY. Mr. Powell intimated that you had found that a very low degree of temperature was necessary.

Mr. TAYLOR. We have found that true in practically all the Northern fruits; those to which our investigation has thus far been limited.

Right in that connection this fact has become apparent: The entire refrigerated-fruit service of the Atlantic appears to be based upon Australasian experience. The crews are very largely British, and the experience in ocean fruit refrigeration is very largely Australasian experience. Their conditions are quite different from ours. All the men with whom we have come in contact on the ocean steamers are afraid of low temperatures for fruits, and yet our land tests have demonstrated this year, as Mr. Henry states, that peaches keep best in low temperatures. For instance, peaches which can be kept ten days in a temperature of 36°, the ordinary peach temperature of most storage houses, can be kept thirty-three days in a temperature of 32° and come out equally sound and remain sound as long after removal.

Representative HENRY. Do you not find even a lower temperature, 30° to 31°, is preferable?

Mr. TAYLOR. The indications favor that, yes; but there is perhaps a little uncertainty on that point. It appears probable that it will be necessary to modify the entire ocean practice in regard to the temperatures for those fruits. The best we have been able to do in compromise with the steamship companies on these peach shipments has been to secure a temperature of 36°, they conceding a drop of 2° if we would concede a rise of 4°, so that we do not consider that these have been forwarded under the best conditions that are practicable on the ocean.

Representative SCOTT. What is the best temperature for winter apples?

Mr. TAYLOR. Our experience all indicates a low temperature.

Representative SCOTT. Below freezing?

Mr. TAYLOR. From 31° to 33°. Our duplicate tests have not run as low as 30°, but the range of 31° to 33° we believe to be the best.

Representative HENRY. If I correctly understand Mr. Powell, he prefers a temperature for peaches of from 30° to 31°?

Mr. TAYLOR. The last test that was made appears to indicate that, but that came just at the close of the season, so that we do not feel that we can establish that as a general principle. We need to test further.

The CHAIRMAN. That is practically the main point to be determined as yet in the peach shipments?

Mr. TAYLOR. The question of handling from the orchard to the car is a very important one. We have not done any expert work on that. The question of the rapidity of getting fruit from the tree into the iced car and of the temperatures in the iced car in transit, which we are studying in cooperation with some of the refrigerator car people, is a still more important one.

The CHAIRMAN. Could you regulate that?

Mr. TAYLOR. We must regulate that.

The CHAIRMAN. Can you regulate it in an iced car?

Mr. TAYLOR. The question of the temperature in different portions of the iced car is entirely an unsettled question. We have made some tests of that through Mr. Powell's work in connection with these shipments, especially from Georgia, by placing recording thermometers in different portions of the car and testing different methods of ventilation in transit, and I would say in this connection——

The CHAIRMAN. I do not believe any of those iced cars could maintain a level temperature. They vary very much.

Mr. TAYLOR. This has been found true, that the fruit in the bottom tier of carriers in the car will keep in the storage house very much longer than the fruit in the top tier.

The CHAIRMAN. In the car?

Mr. TAYLOR. Yes, sir; and that resulted in a radical change in the method of storing at certain receiving points this year, because heretofore they had found certain carriers of their peaches in the storage house sound, and other carriers in the same shipment bad. It was not known why. They had been storing the fruit in the storage house without any regard to its previous location in the car while in transit. This year at one storage house they took the cue from our work and stored each carload by tiers—that is, the bottom tiers went in one place in the storage house, the second tier in another, and the top tier in another, and they found that the fruit from the top tiers did not keep as long by several days as the fruit in the bottom tier of the same car.

Representative WILLIAMS. That was because it was colder in the bottom, I suppose?

Mr. TAYLOR. Yes, sir; it was simply a question of lack of uniformity of temperature in the car while in transit.

The CHAIRMAN. I should think it would be very hard to attain uniformity of temperature.

Mr. TAYLOR. It is; but we believe it is possible to secure greater uniformity than occurs at present.

The CHAIRMAN. They do not attempt to attain it in the transportation of beef for interstate commerce?

Mr. TAYLOR. No, sir; because they can safely have a wider range of temperature than we can. Freezing does not materially injure beef. Mr. Powell is to-day in conference with the managers of two of the largest car lines on just that point. They are seeking suggestions for experimental work along that line.

The CHAIRMAN. What is the next item?

Mr. TAYLOR. I would like to refer for a moment to an export shipment of Bartlett pears from western New York this season. You will remember that last year we made a small shipment. We took about 50 barrels of fruit, packed it in barrels, boxes, and half boxes, testing a wrapper in each style of package, grading the fruit, so that it should be uniform in order that we might get a fair test of the market as seen through the eyes of the buyer. This year we duplicated that test, putting it on a carload basis, so as to get carload rates both by rail and ocean and to test the market for a larger quantity—what would be practically a commercial shipment. We secured a carload in Niagara County from one of the growers who had cooperated in our test of last year, Mr. F. M. Bradley, of Barkers. That carload was packed in barrels, boxes, and half boxes, testing two kinds of wrappers, the California fruit paper wrapper, which costs 55 cents a thousand wraps, and common white newspaper, which costs 20 cents a thousand wraps. The California wrapper is the one in general use on Pacific coast fruit, and has been considered the final thing in wrappers for export.

The CHAIRMAN. A little more air-tight, perhaps?

Mr. TAYLOR. No, sir; it is a specially made soft paper, which is rough on one side and smooth on the other, the roughness so that it will cling to the fruit upon which it is wrapped, but it is quite an absorbent, porous paper, and that is the point of special merit in a wrapper on these fruits, so that the wrapper will take up the moisture as the fruit is withdrawn from storage—the condensed moisture of the air upon the fruit. The results of this shipment we have translated into value of naked fruits per barrel at the packing house, taking out the entire cost of wrapping except the labor, which we could not determine; taking out the wrappers and the packages, and bringing it all down to a barrel basis of naked fruit at the packing house. On this basis we secured the following net values:

The unwrapped barrel of fruit netted $1.91 in the standard grade Bartlett; the wrapped barrel netted $2.53. The wrapper, the wrapping, and the packing would bring that down approximately to the value of the unwrapped barrel. The unwrapped 40-pound boxes netted $3.08 per barrel for the fruit. The unwrapped half box netted $4.09 per barrel for the fruit. The California paper wrapped half box netted $4.80. The newspaper-wrapped half box netted $5.03. The difference in the case of fruit in this package between the two wrappers, was 23 cents per barrel net, that difference growing out of the lower cost of the newspaper wrapper, which any man can obtain at his printing office.

The fruit in 40-pound boxes wrapped with California fruit paper netted $5.41 per barrel, and the newspaper wrapped box netted $7.09 per barrel; so that we have there, on the identical grade of fruit sold at auction to the same people on the same day, a range of from $1.90 per barrel net, up to $7.09 per barrel net, a range of 496 per cent, depending solely upon the package and the wrapper.

Representative SCOTT. Why do you suppose that they paid more for the newspaper wrap than for the California wrap.

Mr. TAYLOR. They did not, in general, pay more for it, but the net result was more because the cost of the wrap was less.

Representative SCOTT. Did they pay as much or less?

Mr. TAYLOR. In all cases but one they paid the same price for the

California wrap and the newspaper wrap. In one case, however, in a lot of sixty odd packages they paid distinctly more for the newspaper wrapper, and the report of the consignee is that the newspaper wrapper suits their trade better.

The CHAIRMAN. What is the color of the California wrapper?

Mr. TAYLOR. The color of the California wrapper is a light manila about the color of this paper [indicating]; but it is a soft and very flexible paper, rough on one side.

You may be interested in this fact, which was reported to me by the grower who permitted us to use his fruit in this shipment, that the net returns on the carload shipped in this mixed up way—including the lots in barrels, which yielded a very low net—were $851.58, the highest net returns for a carload of Bartlett pears that he knows of from Niagara County; so that there is a distinct margin—a margin in this case of at least 60 per cent in favor of the foreign market for this fruit.

Representative ALLEN. What was the relative condition of the fruit as to soundness?

Mr. TAYLOR. In those several packages?

Representative ALLEN. Yes.

Mr. TAYLOR. The consignees reported that the fruit was all in perfect condition, and we did not anticipate that; but I will read you, if you desire, their comment.

Representative ALLEN. No; I do not care for that.

Mr. TAYLOR. I submitted a series of questions in regard to the handling of the shipment, and these are their answers:

> The steamer *Minneapolis* arrived at 7 p. m. on the 22d of September, and the refrigerator was opened at 8 a. m. on the 23d. The temperature of the compartment was 36 and the fruit in good condition. The consignments were railed from Tilbury, a distance of 14 miles, to a railway depot about 3 miles from our warehouse. All the fruit was sound, and there was no appreciable difference in this respect.
>
> We may mention, however, that the larger pears were the ripest; and although in many instance the fruit was green when taken out of the refrigerator, within forty-eight hours it was quite ripe and fit for consumption.

We held fruit out of this same lot in the same temperature here in Washington for comparison. We have here an accurate water-color painting of the fruit as it went into the packages, or rather as it left New York, and here a painting of the fruit on the day of sale—of the fruit stored here at 36° in this city. There had been but very little coloring, but there was some coloring in transit.

The CHAIRMAN. It is the identical pear, is it?

Mr. TAYLOR. Not the same pear, but a representative specimen out of a package from the same lot that we stored here on the day that the steamer sailed from New York and which we withdrew from storage here on the day of the sale in London.

This we contemplate using in publications for the information of growers as to the stage of ripeness in which to pick for export. One of the most important things that we need everywhere in the storage and marketing business is more accurate means of determining and describing "condition." At present, condition is largely a conception in the minds of expert fruit handlers. Certain dealers can tell by inspection whether a fruit will keep in storage or not, but the grower has not their experience. He has not their opportunity to get the experience and the training, so that we are as far as possible recording "condition" in the form of colored illustrations. We are taking the color as an index to condition. I wish I had here a set of paintings which Mr. Powell will use to-morrow in Illinois before a State horticultural society to illustrate the changes that occur in the storage of peaches and pears when stored at different temperatures and in different "conditions" of ripeness. We have the whole thing in series, so that we shall be able, we believe, ultimately to place in the hands of the man who has fruits to store or export a sort of index to the stage of ripeness in which he may safely store or export it.

The receivers say further:

> We have attentively examined the three kinds of package. There was very little difference in condition and appearance between the fruits packed in California paper and that in newspaper. We think, however, that the newspaper would be the best, as, being harder, it gives more protection. We strongly advise that all pears should be papered, as the extra expense is more than compensated for by the less risk.
>
> At this season of the year we generally have a supply—smaller or greater, according to the crop—of pears from France and also of home grown. The latter consist of Williams (Bartletts), Callabas, and several other kinds, but the quantity is very limited. This year Williams and other sorts of English pears have been particularly short. The principal French varieties are Williams, Duchesses, Beurre Hardys, and Glout Morceaux. All these are regularly sent to the London market, the bulk being Williams and Duchess. This season, in consequence of the heavy rains in France, nearly every variety has suffered in appearance, which naturally has helped the sales of Californian and American fruit in general.
>
> There can be no question that the public here are taking to American pears, and if in any season the crop should be large and prices moderate on your side a ready market will be found here. As a rule, the pear trade somewhat falls off about November, when the weather begins to get cold, and the pears do not ripen so well as earlier in the season.

Representative ALLEN. Did you come out loser in that shipment?

Mr. TAYLOR. We made that shipment on this plan: I personally made a verbal guaranty to the grower that we would guarantee to him a minimum return at his shipping station of $3.50 per barrel on the barrels, of $1 a box on the 40-pound boxes, and of 55 cents a half box on the 20-pound half boxes. That we did in order to stimulate his interest in it, so that he would get the necessary help together to grade and pack it and to take the trouble to do the work. This shipment cost us in guaranties (entirely on the barrels, for those were the only ones that fell below the guarantee rate) about $20.

Representative ALLEN. Did the others exceed that rate?

Mr. TAYLOR. They exceeded it, and left him a very handsome profit over the home value. In fact, the total value of the shipment was about $5.37 a barrel f. o. b. at the shipping station where he was selling the same fruit to his local buyers for $2.50.

We made a number of tests of Kieffer pears, both from Delaware and from New York. I would say that our heaviest item of expense in this whole shipment work was here, where we did not expect it at all. The Kieffer pear is supposed to ship in perfect condition in almost any kind of package. It is shipped in carload lots in bulk as far as Minneapolis from Delaware, but in a carefully planned shipment to London, Liverpool, and Hamburg, where we tested barrels, boxes, and half boxes, practically the whole lot went down in transit, shipping in common stowage, as we did; and that shipment will cost us, before we are through with it, about $600, simply for the value of the fruit and the packages. But it did this, and did it at the right time: It informed all our other shippers—and the Kieffer pear export business has grown nearly tenfold this year as the result of the beginning last year—it notified growers at once that Kieffer in that stage of ripeness and grown in abnormally wet seasons must be sent in refrigeration. The receivers had been telling us at the other end all the time that Kieffer did not need refrigeration, and they were ascribing the bad condition to barrels and wrong packages; but that one shipment demonstrated positively that it was not the package that was wrong, but that it was the condition of the fruit that was wrong, and that it required refrigeration. We have now on the water a cooperative shipment of half a carload of Kieffer in refrigeration and in common stowage, which we believe will positively demonstrate this.

Representative ALLEN. Have you made any shipments from the Middle Western States?

Mr. TAYLOR. Of Kieffers?

Representative ALLEN. Yes; and especially from Indiana.

Mr. TAYLOR. No, sir; we have not been able to take up the shipment work from points as far from the seaboard as that yet, except in the case of the apple shipment which was offered us practically without cost and practically without travel cost.

The Kieffer pear exports this year have amounted to about 23,000 barrels, against about 2,300 barrels last year, which was the first year in the export trade in this fruit. The Hamburg market will not take Kieffer. The British markets all take Kieffer when it arrives in good condition.

Representative HENRY. The quality is very inferior, is it not?

Mr. TAYLOR. Yes; as a pear for eating out of hand, although it is an excellent cooking pear, and a pear which all of us are buying in cans under the Bartlett label, to a very large extent.

Our Hamburg consignee reports:

> Your Kieffer pears have also arrived, but I am very sorry to say they are in very poor condition. They are very rotten as well in barrels as in boxes, and apparently the wrapped pears even more than the others. Surely this kind of pear can not stand the voyage in the hold (ordinary cargo), but must be shipped in refrigerator compartments. At the same time I may tell you that Kieffer pears will never introduce themselves into Germany, because Bohemian and French pears have a far better taste.
>
> In to-day's sale I offered your Kieffers and the result was a very bad one on account of the rotten condition of the whole shipment. As I wrote you in my last, there was not a single lot sound, the wrapped pears just the same as the unwrapped. I have seen even more bad ones in the wrapped cases than in the unwrapped. Besides this, the good ones will also go rotten very soon, having already large spots in the shell, and fully ripe.

In that particular we agree in so far as the quality is concerned.

In our storage work we have covered in a comprehensive way the important fruit-storage centers that we could reach. We have gone as far west as Kansas City and Chicago. We have made tests at Buffalo, Philadelphia, Hartford, Jersey City, Chicago, and in this city, and we find a very active interest on the part of the storage men, who realize that the problems in fruit storage have not been overcome. They have not succeeded heretofore in taking it up in a systematic way, and one proposition that has grown out of this and which is now under discussion looks toward the storage of citrous fruits, toward experiments in which a railroad system, a storage house, and an organization of growers cooperate and spend one-third of the cost each in order to help work it out.

We are in conference with the people who are arranging the tests along the lines that we are following in these other fruits, in an effort to work this out in advance of our ability to take it up, because of our lack of appropriation.

That is one of the most important items that we desire to enlarge upon the coming year in the storage work—the storage and shipment of citrous fruits from the Pacific coast—especially lemons, which ripen at the wrong time of the year in California to supply the trade of the East, lemons ripening in the fall and early winter, when people do not want lemons as they do in the summer.

Now, I would like to say just one word, if I may——

The CHAIRMAN. You have not touched on your sweet-potato work.

Mr. TAYLOR. I beg your pardon, sir. We have made several shipments of sweet potatoes, and these to a private consignee. The auction handlers of produce in all the large cities of the United Kingdom report no demand for sweet potatoes that would warrant them in encouraging shipments. We are working through the oldest fruiterer in the city of London in the way of private sales. We are making him regular shipments each week and he is distributing little leaflets on the cooking of sweet potatoes for us. He is selling at private sale and reporting back the results.

I have this letter from him, received yesterday. This report of 10 barrels of sweet potatoes from the Chesapeake peninsula, made in October, nets back the equivalent of about $4 per barrel at New York, and his sales thus far have netted about that figure. The report is as follows:

> They do not sell very fast, but we are moving them as we can. They are all sound so far.
>
> Those I mentioned as coming in before yours came from Barbados and came through a firm here and are red. The majority of buyers prefer the white ones. I am now quoting them in grocery papers, as we have a good many of that trade on our books, and this may lead to further development.

Representative ALLEN. What temperature is best for sweet potatoes?

Mr. TAYLOR. We can not get any particular temperature on the ocean for sweet potatoes. We have to send them common stowage. We would not dare to put them in a refrigerator compartment, where we can not get higher than 40°, and that, in our judgment, would be too low for the sweet potatoes.

The sweet potato, as a practically unknown thing, requires an entirely different style of campaign in introduction to foreign markets from the Bartlett pear, which is known and which simply needs to be laid down in sound condition to find its market.

The CHAIRMAN. It is absolutely the introduction of a new food?

Mr. TAYLOR. It is the introduction of a thing with which the people are not acquainted.

Representative ALLEN. Now, in reference to grapes.

Mr. TAYLOR. On our grape investigations the results have been like this: We established, some three years ago, cooperative vineyards—one in North Carolina and one in Florida. The North Carolina vineyard consists of 3 acres, and we reimburse to the planter the cost of maintenance, not to exceed $150 a year. The Florida vineyard consists of 1 acre, and we reimburse there the cost of maintenance, not to exceed $50 a year, and we pay the man in charge $50 per year for his personal services.

Mr. GALLOWAY. You might explain what those grapes are.

Mr. TAYLOR. Those grapes are the European table grapes, those which we get to some extent from California, but which, ever since the days of John Smith, here in the Eastern portion of the country, have failed. We believe that the primary reason for failure was the phylloxus insect, which is now giving trouble in Europe and in California, which attacks the root of the European grape, but to which certain of our native grapes are resistant. So that, following the line of work in France and Spain, we are testing the choice table varieties on resistant native roots in this climate.

Now there comes up the question of control of leaf diseases. That we endeavor to accomplish by systematic spraying, and there comes up what is still more important in connection with any commercial effort in this Southern region, the securing of varieties adapted to the climate that will ripen early enough to find a place in our market. It is out of the question to grow grapes in Florida for sale in New York that would compete with New York grapes in season, because the price of grapes is then so low that unless they are of very superior quality they could not be sold in competition, because of the heavier freight cost.

This season we have had opportunity to test a large proportion of the varieties at these stations—something over a hundred varieties—and our grape expert, Mr. Husmann, has boiled the list down to eighteen or twenty sorts, which appear to be well adapted to growers in northern Florida and to a few which appear to be suited to the North Carolina sand-hill region, which extends across South Carolina, and is representative of quite a large tract of country.

Our purpose is to slightly modify the nature of these specimen vineyards, to eliminate those varieties which we have tested and which fail, to increase our number of vines of those which succeed, with a view to getting quantity enough to test actual shipment work to get at their shipping quality in connection with their productiveness and their resistance to disease.

Representative ALLEN. Which do you regard as the best domestic grape in this country—say, for instance, in Illinois, Indiana, and Kentucky?

Mr. TAYLOR. That would depend considerably upon the particular locality and the soil. I could not mention offhand any grape more likely to succeed with you as a midseason grape than the Concord, and yet it would be subject to black rot somewhat, and it would be necessary to spray and protect it from fungous diseases in order to get a crop at all regularly of sound fruit.

Representative ALLEN. What do you think of sacking grapes?

Mr. TAYLOR. For gardens and for fancy trade that is exceedingly desirable, and we are testing sacks in contrast with sprays on certain of these European sorts. I have here paintings of some of the varieties that ripened in those vineyards this past season.

Representative ALLEN. What is the proper time to sack?

Mr. TAYLOR. Just as soon as the blossoms fall; in our experience the sooner after the blossoms fall the better, when the grapes are not bigger than duck shot.

Mr. GALLOWAY. These are an entirely different class of grapes from the ordinary American sorts. They are the fancy grapes that are shipped in from Belgium and those regions where they are grown under glass.

Representative ALLEN. These are foreign grapes, are they?

Mr. TAYLOR. Yes, sir.

Mr. GALLOWAY. But there will be a market for such grapes in our large cities here in the East.

Mr. TAYLOR. These are grapes of varieties which, when imported from Europe, are obtainable at the fancy fruit stores, and sell from 50 cents to $1 a pound. They represent an entirely distinct feature of our viticulture. It seems important to extend this investigation of resistant stocks to the Pacific coast, and our expert is in the West at this time making careful survey of the conditions there with a view of inaugurating certain cooperative tests of the adaptability of certain resistants to the typical vineyard soils of the Pacific coast, and then of determining the relative congeniality of the leading commercial varieties of the grape to the different stocks that are bound to succeed. It is a very important question to the entire wine and table grape interest of the Pacific coast. The time appears ripe for systematic work along that line.

Representative GRAFF. Mr. Chairman, will you pardon me a moment? Is it intended to proceed for some time?

The CHAIRMAN. No; I was going to let Mr. Taylor finish, and then take a recess until 2 o'clock. The vote on the London dock charges bill is to be taken, I believe, at about 4.30. I thought we would continue until about 4.15, and perhaps get through with Mr. Galloway's bureau to-day.

Mr. TAYLOR. Those points, Mr. Chairman, cover the more important points of our work. I would be very glad to answer any questions.

Representative ALLEN. Do you know anything about the Gordon peach?

Mr. TAYLOR. No, sir.

Representative ALLEN. Have you had any experience in cultivating that?

Mr. TAYLOR. No, sir.

Representative ALLEN. Have you ever seen it?

Mr. TAYLOR. No, sir. Can you tell me where it originated?

Representative ALLEN. No, I can not. It is a very large peach, and ripens about the middle of October.

Mr. TAYLOR. Would that be in southern Indiana?

Representative ALLEN. In Kentucky. I think I got it from a local nursery in Todd County. It is a very fine, solid, juicy peach.

Representative HENRY. The Elberta is a good shipping peach, is it not?

Mr. TAYLOR. Yes, sir; the Elberta is, among the Eastern grown varieties, now about the best shipping peach we know anything about.

Representative HENRY. The quality is not up to some of the older varieties?

Mr. TAYLOR. No.

Representative HENRY. It is showy?

Mr. TAYLOR. The fact that it arrives in sound condition counts in its favor.

The CHAIRMAN. We will take a recess now until 2 o'clock this afternoon. We can then go on with Professor Galloway and probably finish his Bureau this afternoon, and to-morrow we can go on with another bureau.

ADDITIONAL STATEMENT OF BEVERLY T. GALLOWAY, CHIEF OF THE BUREAU OF PLANT INDUSTRY, DEPARTMENT OF AGRICULTURE.

Mr. GALLOWAY. The four items remaining for the Bureau of Plant Industry are "Experimental gardens and grounds," "The Arlington Experimental Farm," "Tea-culture investigation," and "Purchase and distribution of valuable seeds."

The CHAIRMAN. That closes your Bureau?

Mr. GALLOWAY. That closes our Bureau.

The CHAIRMAN. Take up "Experimental gardens and grounds."

Mr. GALLOWAY. Taking first the experimental gardens and grounds, I would like to say a few words in regard to the work.

This is one of the oldest branches of the Department, and there are always a certain number of fixed charges connected with it. By fixed charges I mean those covering care of the grounds, greenhouses, walks, roads, etc. There are about 40 acres in the ground to be taken care of, as well as trees, shrubs, and roadways, and then there are already 50,000 square feet of glass, something over an acre. All this must be cared for and handled by a corps of men, gardeners and others, and the expenses connected therewith we classify as fixed charges. The expenses connected with the gardens and grounds have been increased since the reorganization of the Bureau, for the reason that we have arranged to have certain classes of work carried on by all branches there.

For example, the pathological work has a large greenhouse which is in the nature of a hospital. There is nothing else in this house but sick plants. They are sick when they are brought in, or made sick by the work of the gentlemen who are engaged in various lines of investigation. Then there is another large house that is devoted entirely to the propagation of plants that are brought in as the result of our foreign explorations. We have scientific agricultural explorers in many parts of the world, and they find new plants which are sent here for their propagation. This work is going on constantly and is a part of the regular work of this particular branch of the Bureau.

Representative ALLEN. Where do lemons succeed in this country?

Mr. GALLOWAY. Lemons are being grown in California and in Florida. Since the frost in Florida lemon culture has gone ahead quite a good deal in California.

Representative ALLEN. They are not as susceptible to frost as are oranges, I believe?

Mr. GALLOWAY. They are somewhat more hardy than oranges, and there is more money in them if they are properly handled. The question was discussed here to-day in regard to the methods of storing and shipping lemons, which comes within the scope of another branch of the Bureau. All we are concerned with here is the propagation of these things. After we get them established another branch of the Bureau then looks after them. The most striking case of the establishment of an industry through this particular branch of the Department is the navel orange. The two original navel orange trees are in the old conservatory yet. They were brought from Brazil, and the whole Riverside industry, the whole California navel orange industry, originated from these two trees.

Representative HENRY. Some thirty years ago?

Mr. GALLOWAY. Some thirty years ago.

Representative SCOTT. How long will an orange tree live?

Mr. GALLOWAY. It will live for perhaps more than a hundred years. We do not know how long it will live, but the navel orange as it is now grown in California has deviated from the type.

Representative HENRY. The type has been modified?

Mr. GALLOWAY. The type has been modified in a number of ways. The two old trees here have maintained their individuality. Every year they bear the same standard fruit that they bore when they originally came here. One of the first things we did when this work was turned over to us two years ago was to get up stock from the old trees. Some of this was sent to California and some to Florida, although the navel orange does not succeed in Florida as well as it does in California.

Aside from the work described, we have going on in this branch of the Bureau all that work which pertains to the handling of the miscellaneous plants that are sent out through the Congressional seed distribution. All the grapevines and strawberry plants——

The CHAIRMAN. Under the appropriation?

Mr. GALLOWAY. Not under this appropriation, but the men who pack these things are expert gardeners, and they take a small part of the fund provided for the seeds; but it does not pay for all.

In addition to what has been described we are endeavoring to develop there certain lines of horticultural work which are in themselves entirely distinct from the pomological investigation, but which have for their object the encouragement of certain lines of industry in this country they are fast assuming large proportions. I have reference now particularly to the growing of plants under glass. This is an industry that amounts to ten or fifteen million dollars a year; there are about four million dollars' worth of roses sold in this country every year—just cut flowers alone. The work is so intensive that every foot must be made to pay, so that many questions are coming up with regard to how to get to the largest yields from the smallest amount of space. These are questions that can not be solved by the individual horticulturist or individual greenhouseman, so we are endeavoring to work out a number of them. We have established two lines of investigations, (1) with plants that are used entirely for ornamental purposes, such as carnations and violets, and (2) with plants that are used for foods, such as vegetables, that are grown under glass. We are endeavoring to improve the different varieties of these crops and to determine the conditions which will give the highest yield at the least expense.

In the case of roses, for example, they are grown in 3 inches of soil, so the conditions are entirely different from what they are out of doors. It is a question of the best yields per square foot. A man can not afford to do this work unless he can get at least 60 or 75 cents per square foot. If he can get a dollar he is making money.

These are some of the questions in which we are interested from the view point only of endeavoring to throw light on the preferred of present conditions.

The increase we have asked for, namely, $5,000, is largely intended to be used in the reconstruction and rearrangement of the old houses that have been there a good many years. I think I can say now that the increased appropriation asked for, which brings it up to what was estimated for last year, will be ample to run us for a number of years, and we will not have to ask for any more.

The CHAIRMAN. Will not these houses have to be torn down when the new agricultural building is erected?

Mr. GALLOWAY. No, sir; the new building comes within the reach of only one house. This is a large conservatory, and the wing could be just as well taken out of the way, because it is only an ornamental thing and it is filled with ornamental plants. One end of it could easily be discarded.

In addition to what has been described we are endeavoring to develop on our grounds groups of plants that have certain economic importance. We have a great many visitors from all over the country—men from experiment stations, men from agricultural colleges, and men and women from other educational institutions where agriculture is beginning to attract attention. There has been a great deal of interest taken in the last year or two in the matter of agricultural education in the public schools. There is a great deal of talk about nature-study work, which is simply a groping after something that will reach the child in its earlier stages and teach a love for home, which is the basis for our civilization.

We are establishing on the grounds a collection of plants which wlil enable teachers and others who come there to see what can be done in a small way by the use of small gardens in connection with their school work in the different States. Then we are bringing together a collection of medicinal plants, a collection of fiber plants, etc. They are useful things that may be utilized by people who may come here as object lessons.

Representative SCOTT. Are you doing this on the grounds down here?

Mr. GALLOWAY. We are doing it on the grounds; but only in a limited way yet.

This briefly covers the experimental gardens and grounds, so called, a title which we do not like, but which we have used simply because it is an old name. We usually refer to it as the horticultural department, because its work is horticultural of the intensive sort. If there are no questions, Mr. Chairman, I am through with this branch of the Bureau.

The CHAIRMAN. The persons named in the paragraph immediately under that are not all the persons you have paid from that roll?

Mr. GALLOWAY. No.

The CHAIRMAN. Are there any persons paid from that roll detailed to do work in other places?

Mr. GALLOWAY. No; we do have something in the nature of a detail, namely, the horticulturist. We used to have on the statutory roll a superintendent of gardens and grounds, at $2,500. That was eliminated when the Bureau was organized, and now we have a horticulturist who is in charge of the grounds and all the work connected therewith; also the Arlington farm.

The CHAIRMAN. At $1,600?

Mr. GALLOWAY. No; that is not the man.

The CHAIRMAN. Where does he come in; in what lump sum?

Mr. GALLOWAY. The lump sum of the Arlington farm. We pay him from that part of the year and from the lump sum of the gardens and grounds part of the year. He is charged there to the Arlington farm.

The CHAIRMAN. There are temporary people on gardens and grounds that do not seem to be shown here at all. I can not tell from this note just what it does mean. The note is not clear.

Mr. GALLOWAY. I will take that up later and will submit a list of the people who are regularly employed.

The CHAIRMAN. You see in that note there is a foreman of experimental gardens and grounds, $1,600.

Mr. GALLOWAY. Yes.

The CHAIRMAN. If you think it wise to transfer him just say "one foreman, experimental gardens and grounds," so the name will locate him to us. Now, one expert, at $1,000.

Mr. GALLOWAY. That is a case of an expert gardener who is a propagator and who is in the nature of a temporary employee.

The CHAIRMAN. He is temporary, is he? Are both those experts temporary? In fact, there are three of them; one at $1,000, one at $900, and one at $720.

Mr. GALLOWAY. They are all gardeners. The reason the word "expert" was used is the fact that under the old arrangement all these old gardeners were covered in at one time by the civil service. At this time we had no class of gardeners to draw from, and so we appointed experts, but they are not in the nature of permanent employees, except that at $1,200, and he is in charge of that propagating house.

The CHAIRMAN. The $1,600 man, you mean?

Mr. GALLOWAY. He is the foreman of the whole grounds. The $1,200 man is another man. The $1,000 man is also an expert propagator of plants. We call him and classify him as an expert. He may work a year and then we may not have any further use for him. It is not in the nature of a permanent place.

The CHAIRMAN. Of course laborers are not permanent. You have a great many more employed in the summer working season than in the winter.

Representative ALLEN. What does the laborer at $780 do?

Mr. GALLOWAY. That particular man, my recollection is, is in the packing house. He is an expert who handles and ships the plants.

Representative ALLEN. Does it require an expert man for that?

Mr. GALLOWAY. A very expert man. It requires knowledge how to do up plants so that they will go to the other side of the continent, maybe, in good shape.

The CHAIRMAN. These two laborers at $720 are of the same character?

Mr. GALLOWAY. They are the same character. Some of these laborers put down here are classified on the rolls as laborers when they are doing miscellaneous work.

The CHAIRMAN. They are in that lump sum, are they?

Mr. GALLOWAY. Yes; strictly speaking, they would be classified with the gardeners, but at the time these were all covered in, last July, they were classified as laborers, and they are classified here as laborers.

The CHAIRMAN. There is no clerk paid from that roll?

Mr. GALLOWAY. No clerk.

The CHAIRMAN. Detailed to another department?

Mr. GALLOWAY. No, sir.

Representative ALLEN. Here is a painter at $720.

Mr. GALLOWAY. Yes, sir; we have a painter.

Representative ALLEN. What does he do?

Mr. GALLOWAY. He is kept busy constantly keeping the acre of glass in repair.

The CHAIRMAN. Yes; I know he is. Putty and glass is the most expensive luxury I know of. I indulge in it to a slight extent, to my sorrow.

Representative ALLEN. He is really a glazier then, is he?

Mr. GALLOWAY. Yes, sir.

Mr. GALLOWAY. There is about 10 per cent loss of glass every year from breakage in greenhouse work; so on an acre of glass that means quite a good deal of work. Then breakage from handling glass is another considerable item. Shall I pass now to the Arlington farm?

The CHAIRMAN. Those other laborers, and what not, named there are simply employed during the season, temporarily?

Mr. GALLOWAY. Yes.

The CHAIRMAN. Do you cut down your force of laborers in the winter?

Mr. GALLOWAY. Yes; we do.

The CHAIRMAN. Or is the pressure so great that you have to keep them all the year?

Mr. GALLOWAY. There is no pressure to keep them there now; that is, there is no reason why we can not let them off at any time. There is no pressure from the outside. The whole system is elastic. It frequently happens, however, that we get a man in the way of a laborer, and he may turn out to be a better man than some of the permanent laborers; so we may keep him and let off some of the men who have been there.

The CHAIRMAN. That is betterment of the service.

Mr. **Galloway**. We are shifting them constantly.

The **Chairman**. You do not keep these men all the year there?

Mr. **Galloway**. No; not all the year.

The **Chairman**. Because on the outside work there is nothing to do after the 1st of December.

Mr. **Galloway**. There is plenty to do inside, because all of our packing is done in the winter season and we have a packing shed or shelter in which we keep our material, where the weather does not interfere at all. Our busiest time, so far as packing is concerned, is from the 1st of September until the 1st of May. Of grapevines alone last year we packed and sent out something over 300,000, and in a good many cases they were packed one in a package; that is, each vine would have to be rolled up in oil paper, in moss, tied in a bundle, and properly mailed.

Representative **Scott**. Will you come back to that tree question again, or shall I ask a question about it now?

Mr. **Galloway**. We do not touch fruit trees at all. There is one line of work we do, however, in the matter of trees that is worth stating. We are collecting from places here in Washington and other places in the country seeds from trees that have historic interest. It is done in a small way and at slight expense. The seeds are planted here on our grounds, either at the flats or over on the Arlington farm, and it is our plan eventually to send out those trees, just simply one at a time, to schools, with a little statement and, perhaps, a picture of the tree. There is a lot of sentiment in it, but there is something else in it besides. It all goes back to teaching the love of trees and encouraging tree planting and encouraging patriotic sentiment in certain directions. It probably does not cost us over $500 or $600 a year to do that, and frequently, instead of sending the trees, if we find people who are responsible and can handle seed, we will send them a couple of dozen seeds, or something of that kind. For example, we had three or four barrels of walnuts which we collected from Mount Vernon from trees near Washington's tomb. We had the seeds of trees collected from the White House grounds.

Representative **Henry**. What variety of walnut was that which came from Mount Vernon?

Mr. **Galloway**. Black walnut. That is one line of work that is not connected with the seed department that is being carried on by the men in the gardens and grounds.

The **Chairman**. You do practically no experimental work outside these gardens and grounds? Most of your experimental work is inside of the greenhouses?

Mr. **Galloway**. Most of the experimental work now is inside the greenhouses, since we have acquired the flats down on the river and the Arlington farm. You see we have 30 acres of ground just four blocks south of the Department building.

The **Chairman**. What are you doing with that?

Mr. **Galloway**. We are using the ground as a testing station largely. I will come back to that. The land cost us nothing. It was turned over to us by the War Department. It is intensely rich, from 10 to 15 feet deep, and perfectly level.

The **Chairman**. It is dredgings from the river, is it not?

Mr. **Galloway**. Yes. I have pictures here of the testing ground. A large part of the work there is connected with the Congressional seed, and I will explain that in a few minutes.

Now, the Arlington farm. We started over there with an appropriation, I believe, of $10,000. Last year it was increased to $15,000, and this year the Secretary has recommended that it be made $25,000, largely for the reason that we have reached a point now where it will be necessary to put up a few buildings. I would like to briefly describe the work that is going on over there—the preliminary work.

The CHAIRMAN. Have you got it all drained?

Mr. GALLOWAY. No, not all drained; but it is all cleared, all surveyed, and the roads all laid out.

Representative ALLEN. Does it not set up on edge?

Mr. GALLOWAY. No, sir.

The CHAIRMAN. It is on the flat?

Mr. GALLOWAY. It is about 60 feet above the river and it is on a sort of shelf. First, there is the Arlington Cemetery, then there is this shelf of land, and then it dips again, and we have some land down on the lower portion.

Representative ALLEN. Is it between the cemetery and the river?

Mr. GALLOWAY. Yes.

Representative SCOTT. It is south of the cemetery, is it not?

Mr. GALLOWAY. It is east of the cemetery.

The CHAIRMAN. Right between the cemetery and the river.

Mr. GALLOWAY. There are all grades of land there. There is rich alluvial land. There are hills, and the first of the year after we got in the drainage and plotted it, two years ago, we put about 100 acres of it in cowpeas, rye, and green manures, and we have been working it down with a view to getting certain experimental investigations started this year. We have experiments going on over there for the purpose of developing the value of the nitrogen-producing plants which Mr. Woods described yesterday. The experts have plats there of several acres where they are growing these different plants. Then the pomologist has a lot of work going on there with type fruits; that is, fruits that have been sent here and planted with a view of maintaining those types. The same thing has been done with other crops. The grass and forage plant man, Mr. Spillman, had about 40 acres over there this year in varieties of forage crops—that is, mostly leguminous forage plants from all over the world—partly with a view of getting some preliminary knowledge as to their value and partly for the purpose of growing seed of varieties that had already proved of some value.

Then, in addition to that, we have going on there quite extensive work in corn breeding. We find it necessary in some of the corn-breeding work described here yesterday to plant considerable areas of corn and to separate it in order to keep it from cross fertilizing. We have put in a number of plats, scattered in different parts of the farm, to keep the straws pure.

There is another quite extensive experiment over there in the matter of determining the relative value of kiln-dried versus air-dried corn for seed. There is a considerable agitation in portions of the country in the manner of using the seed of the corn dried in the kiln. It is claimed it has greater advantages in higher yields, germinating quicker, and other reasons why it should be planted.

Representative HENRY. What do your experiments indicate—that that is true?

Mr. GALLOWAY. The experiments indicate there is very little difference this year. We had several 10-acre plats. We use the corn and other crops for our own purposes. As a result, we have enough corn and other crops there to keep our animals without having to buy anything. There has been nothing done over there so far in the matter of animal work, and the quarantine animal investigations, anyway, are all conducted by the Bureau of Animal Industry.

The CHAIRMAN. They have one out at Bethesda.

Mr. GALLOWAY. Yes. We have nothing of that kind to consider.

The CHAIRMAN. What do you want the buildings for?

Mr. GALLOWAY. We want a barn and we want buildings over there for a superintendent, a man who is to be there permanently on the ground. The additional work in the matter of laying out these grounds and getting plats in proper shape for experimental purposes is going to require what will be left after putting up the buildings, which will probably be from $6,000 to $8,000.

The CHAIRMAN. How large a stable do you want for your horses?

Mr. GALLOWAY. We have from five to six animals at times, and probably more at other times, because they may be sent over there—animals that get broken down in town.

The CHAIRMAN. They get sore toed, as we say, on the pavements?

Mr. GALLOWAY. Yes. They send them out there to rusticate.

The CHAIRMAN. How many animals would need stable room?

Mr. GALLOWAY. Probably 6 or 8 head. The barn has been set back on a hill just opposite the main entrance to the cemetery gate, and there will be a driveway up to that, and in front of the barns will be the buildings for the superintendent, which we hope to erect as soon as the ground is properly platted and as soon as the funds are available, if you see fit to allow them.

I can say also, in connection with this work, that when we reach this point the fixed expenses will probably remain constant for several years, probably a good many years, and we will not have to have any additional funds.

The CHAIRMAN. Will you require $25,000 a year after you get the buildings erected?

Mr. GALLOWAY. Probably from $20,000 to $25,000 a year to keep it up and sustain it and to develop the work as it goes along. Of course all these other branches of the Bureau contribute something, but they contribute very little. For instance, Mr. Woods has his expert working over there on nitrogen organisms. He goes over there and does planting himself, but we do furnish a certain amount of labor, and we find that we can best handle the work in that way, by maintaining a uniform system through the whole thing.

Representative HENRY. What do I understand is the area of the land over at the Arlington farm?

Mr. GALLOWAY. It is about 500 acres.

Representative ALLEN. How much of that is tillable, productive land?

Mr. GALLOWAY. It is practically all so.

Representative ALLEN. There will be a lot of this ground set out in trees permanently?

Mr. GALLOWAY. Yes; it will be set out in trees. We shall have certain illustrative work over there on plantations. We shall carry on some demonstrative work to show how soon plants can be developed into fence posts, for example. Catalpas are adapted to this purpose.

Representative ALLEN. Let me ask you right there, Professor, will catalpas grow in my country?

Mr. GALLOWAY. I do not see why they should not.

The CHAIRMAN. The locust and the red cedar make the best posts.

Mr. GALLOWAY. The red cedar is getting very scarce and the locust is getting scarce. The trouble with the locust in recent years is there is an insect that is doing a great deal of damage all over this country.

Representative ALLEN. In the green timber?

Mr. GALLOWAY. In the green timber. It is killing the trees off very rapidly. The catalpa seems to be free from everything in the way of insect pests.

The CHAIRMAN. Have you tested the durability of the post made from it?

Mr. GALLOWAY. The catalpa has been used for years as railroad ties and found to be very durable.

The CHAIRMAN. Will it last as long as a post in the ground?

Mr. GALLOWAY. I do not see any reason why it should not. It is planted in the West in certain ways just like the corn. It is sowed in rows and thinned out, and to look through it it looks like a corn patch.

Representative SCOTT. We have thousands of acres of it in our State.

Representative HENRY. How long does it take for a tree to grow big enough to make a post?

Representative SCOTT. Eight or ten years.

Mr. GALLOWAY. I just want to illustrate this point, that we have planted catalpas on the flats in that very rich alluvial ground, and have gotten a growth there in one year of 4½ to 5 feet.

Representative HENRY. That was from the cuttings, was it?

Mr. GALLOWAY. That was from the cuttings; yes.

The CHAIRMAN. It is a good, hardy northern tree.

Mr. GALLOWAY. It grows as far north as Central Michigan, and it certainly grows as far north as western New York.

The CHAIRMAN. It would probably be of a little slower growth there, of course.

Mr. GALLOWAY. A little slower growth; yes.

Representative HENRY. In the Genesee Valley it ought to be as rapid as on the Potomac. You have bottom soil there.

Representative HAUGEN. Have you any idea how long it will last for a post?

Mr. GALLOWAY. There are some figures given in that bulletin as to the time of putting out the posts and railroad timber. In fact, nobody knows how long it will last.

That briefly outlines or covers the Arlington farm work. It is work that is developing; and if that bridge ever goes through, it will be so closely connected with the Department as to be really a part of the Department grounds.

The CHAIRMAN. I know it was the intention to land the bridge there somewhere.

Mr. GALLOWAY. We are using it as a purely experimental place. The ground on the lower level is just like the flats. It is rich bottom land, thrown up there by dredging, and there are probably 150 acres in this.

The CHAIRMAN. Why do you need so much ground, the plat you first spoke about and the other besides?

Mr. GALLOWAY. We shall eventually probably abandon these flats, turned over to us by the War Department, as soon as we have the farm developed; but this is all cleared off, and the War Department has been very much interested in the work.

The CHAIRMAN. That is to form, as I understand, part of the park system of the city?

Mr. GALLOWAY. Yes. It was suggested last year that we take the whole thing and put it down to grass. They were pasturing army horses and mules there, and the animals were feeding on the willows. The whole thing could be put down to grass and cleared for five or six thousand dollars. There was an item introduced last year in the sundry civil bill for this purpose, but it did not go through. There is blue grass there 3 feet high.

The CHAIRMAN. Not real blue grass?

Mr. GALLOWAY. Kentucky blue grass, perfectly pure.

The CHAIRMAN. I never saw it grow that high, and I have been in Kentucky a good deal. It is not a tall grass.

Representative ALLEN. It grows that way down in my country.

The CHAIRMAN. I never saw blue grass over a foot and a half high.

Mr. GALLOWAY. This was sown from seed, and in order to prevent the encroachment of weeds from the outside of the fence we cut out a 20-foot strip around the whole thing and set it out in blue grass. Now it is just a perfect blue-grass sod. We let it go to seed every year.

The CHAIRMAN. That will hold then?

Mr. GALLOWAY. Yes.

Representative ALLEN. I suggest to you that it is not necessary for it to go to seed in order to maintain the sod.

The CHAIRMAN. After you get your sod it is not.

Mr. GALLOWAY. There is this thing about this climate: It will run out in two or three years unless you let it run to seed. The strong summer grass will crowd it out.

On the roll of the Arlington farm we have one horticulturist, the gentleman I referred to a while ago, who had charge of the horticultural work and general supervision of this work at the gardens and farm. Then we have also one expert——

The CHAIRMAN. Is that horticulturist at $2,500?

Mr. GALLOWAY. Yes, sir.

The CHAIRMAN. You think he ought to be a permanent employee over there?

Mr. GALLOWAY. Yes.

The CHAIRMAN. I would not call him a horticulturist if I were you. I would call him something that, by his name, we would know where he is at work.

Mr. GALLOWAY. I can call him horticulturist in charge of gardens and grounds and the Arlington farm. We put the two together because we want to identify the work with horticulture rather than with the mere propagation of plants carried on there so long. In other words, we want to throw our energies to the experimental side of horticulture rather than the ornamental side.

The CHAIRMAN. In transferring those people, designate them by a name so that we can place them. You have an expert there at $1,500.

Mr. GALLOWAY. That man is really the head superintendent of the farm.

Representative HENRY. Why do you not call him superintendent, then?

Mr. GALLOWAY. We can not do it. We can not call him superintendent.

Representative ALLEN. You could call him foreman of the grounds.

Mr. GALLOWAY. We could call him foreman. He is the man who looks after all details.

The CHAIRMAN. In transferring this, give the names so we will know where they are at work.

Representative ALLEN. I would like to ask a question or two of Mr. Galloway. Have you done any tiling over there?

Mr. GALLOWAY. Yes, sir; we have done quite a good deal.

The CHAIRMAN. You tiled the whole thing the first year, did you not?

Mr. GALLOWAY. We tiled probably 150 acres; but not all of it, because not all of it needed tiling.

Representative ALLEN. What size tile do you use there?

Mr. GALLOWAY. Our standard sizes are 3 to 4 inch tiles.

Representative ALLEN. To what depth do you put it?

Mr. GALLOWAY. That depends on the nature of the soil. We have the widest variation of soil. In some places we put it down 4 feet and in some places 2 feet. We do not go so deep with a sandy soil as where there is a heavy clay soil.

Representative ALLEN. You get drainage into the river there, do you not?

Mr. GALLOWAY. We get drainage into the river, but we have to take the drainage from all the Arlington Cemetery. Our engineering scheme was quite an elaborate one. We had that immense drainage from upward of a thousand acres on those hills coming down on the place.

Representative ALLEN. How close is the tile together?

Mr. GALLOWAY. In some of the wettest places there we put it 20 feet apart; in other places 30 feet apart, and in some places 40 feet apart; depending on the wetness of the area.

Representative ALLEN. You have a good many rods to tile there?

Mr. GALLOWAY. Yes, sir.

Representative ALLEN. What is about the average price of that tile—I mean the cost of material, not for putting it in?

Mr. GALLOWAY. I could not say as to that. A good part of that tiling was put in before it was turned over to me. It costs about $10 a thousand, if it comes in foot lengths.

Representative ALLEN. Do you not think you would find better results from a larger tiling than a 3-inch tiling?

Mr. GALLOWAY. Some of the tiles run up to 8, 10, and 12 inches in the main ditches.

Representative ALLEN. Farmers in my country are beginning to awaken to the idea that anything less than a 5-inch tile is not useful even for lateral drainage.

Mr. GALLOWAY. We put in a good deal of 4-inch tiling over there. The last tiling we did was of 4-inch, but probably the larger percentage of the lateral drainage tiles are 3-inch tiles.

Representative HAUGEN. There are branches leading to the main ditches.

Mr. GALLOWAY. Yes, sir.

Representative COONEY. There is no examination conducted by the Department in any way to show and illustrate the best system of tiling?

Mr. GALLOWAY. No.

Representative ALLEN. You will find bulletins on tiles issued by the Agricultural Department.

Mr. GALLOWAY. Yes; there are bulletins by the Department, written by experts.

Representative ALLEN. And they are very valuable ones. I had occasion to examine them pretty closely.

Mr. GALLOWAY. There is another point connected with this Arlington farm which has made it rather difficult for us to bring it up; that is, it has been used for some time as a mule pen by the War Department. During that time it has also been used to furnish top-soil for the Arlington cemetery.

Representative HENRY. And what do you do with that?

Mr. GALLOWAY. We have been covering those bald spots with manure, where we could get it. We are often able to get it very easily from Fort Myer. Then we have been putting in green crops, like cowpeas and rye.

The CHAIRMAN. I see there are eight laborers employed there.

Mr. GALLOWAY. They have put down here eight laborers, I see, but the laborers over there are all more or less temporary.

The CHAIRMAN. Do you employ colored laborers there?

Mr. GALLOWAY. Yes; we have both colored and white, and the 15th of this month we will probably let off all the laborers until about the 1st of April. We keep only the men over there to care for the stock. The men who are kept on the rolls by the month all go off. That is the way that work is conducted.

Representative ALLEN. How do you expect to use this additional $10,000; in buildings?

Mr. GALLOWAY. As I explained, in buildings and the gradual bringing of the plot work in such shape that we can use it.

The CHAIRMAN. How much do you estimate your buildings will cost, Professor?

Mr. GALLOWAY. Probably the barn and the other buildings necessary will not exceed eight or ten thousand dollars.

Representative HAUGEN. What is that barn for; just for those six horses?

Mr. GALLOWAY. No. In addition to the barn——

The CHAIRMAN. You have a barn there now, have you?

Mr. GALLOWAY. We have a barn started, but not complete. In addition there will be laboratory rooms for the men working over there. We are going to use the lower part as a barn and the upper portion will be used for certain classes of work that must be carried on in the field. There is now no place over there for the men who are in this expert work to do anything at all; but there are certain preliminaries that must be carried on there in the building. It is something more than a barn.

The CHAIRMAN. Do you want that in connection with a stable—in the same building as a stable?

Mr. GALLOWAY. There is no objection to that.

The CHAIRMAN. Do you not need the loft for storage?

Mr. GALLOWAY. We will use another portion of the building for storage.

The CHAIRMAN. Who planned your building for you?

Mr. GALLOWAY. It was planned by the architect of the Bureau of Animal Industry. They have a regular architect who plans all their buildings. He does the architectural work for the Department whenever he is called upon to do so. The barn itself will probably cost $3,500 or $4,000.

The CHAIRMAN. You can put up a pretty big barn for that.

Mr. GALLOWAY. It is a pretty big barn.

Representative SCOTT. Then do you expect to put up about a $5,000 house?

Mr. GALLOWAY. There will be other buildings put there.

The CHAIRMAN. You are not ready for the house yet?

Mr. GALLOWAY. We will be after the 1st of July—after we get things shaped up.

Representative SCOTT. What other building do you refer to that you think will probably be necessary?

Mr. GALLOWAY. A small conservatory with a heating plant. Most of the tools, I think, can be taken care of in the barn, but there may be some sheds outside of that.

Representative ALLEN. Have you any waterworks over there?

Mr. GALLOWAY. No; we have no waterworks there.

Representative HAUGEN. And the house for the superintendent will be how big?

Mr. GALLOWAY. Probably the house will not cost over $2,500 or $3,000. Professor Corbett will go over there himself, because he has to be there at all times.

Representative HAUGEN. Where is he living now?

Mr. GALLOWAY. He is living in the city now.

Representative HENRY. I thought there was malaria there.

Mr. GALLOWAY. There is some, and he has been advised not to go, but he feels he should be there.

The CHAIRMAN. Is there much malaria over there?

Mr. GALLOWAY. The men who work there suffer from it.

The CHAIRMAN. They do?

Mr. GALLOWAY. Almost all the men; not all of them. The colored men are usually exempt. They live over there in a little village near by. We shift our white men quite often, bringing them over on the grounds, where they work a while, and then they go back again, but as it is now, it is rather an isolated place.

The CHAIRMAN. There is no car line running there, is there?

Mr. GALLOWAY. Yes; there is a car line that runs right by it.

The CHAIRMAN. I did not know that. I thought the cars went up the hill.

Mr. GALLOWAY. We can get on the car there at the Bureau of Printing and Engraving and be at the Arlington farm in fifteen or twenty minutes.

The CHAIRMAN. That is very good.

Mr. GALLOWAY. Shall I pass to the tea culture investigation now?

The CHAIRMAN. Yes.

Mr. GALLOWAY. The tea-culture work the past year has been carried on almost exclusively at Summerville, S. C., in cooperation with Dr. Shephard, but we have reserved about $6,000 of that appropriation for the purpose of extending the work into Texas and some other Southern States, and our men have been down there. We have had two men in Texas looking over the territory with a view to establishing a tea station there, and they have just come back. I have not had a report from them, because I have not seen them since they arrived. My instructions were that they should look over the ground and try to investigate the labor problem and soil conditions in such a way that we could profitably start something of that kind there, provided we would get proper cooperation from people who lived there.

The CHAIRMAN. Why did you not cooperate with the experimental farm down there?

Mr. GALLOWAY. The experimental farm is absolutely unsuited for that kind of work. We had that looked into first. It is not located where there is possibility of doing tea work, so that we must be located somewhere in this region right in through here [indicating]. There is a large area of land in there where the rainfall is just about right and where the population, the colored population particularly, is dense, and where labor is cheap, and there is considerable promise of making a success of tea-cultural investigation.

Representative HENRY. Is it a pine country?

Mr. GALLOWAY. Yes; in part. We have found by experience in our work at Summerville that if we can not get rainfall it will be better to take land that can be irrigated, because we can handle the crop better under irrigation than we can by depending on rainfall.

This tea work has gotten beyond the fad stage, I think; that is, there will be about 9,000 pounds of tea grown this year at Summerville, and there are now about 100 acres in the gardens there. Of course Dr. Shephard has put in a great deal more money in the work than the Government. Our work was largely of a scientific motive. Dr. Shephard has looked after the commercial side and we have looked after the scientific end. Our object in the last two years has been to definitely determine the cost of producing tea on a commercial basis. We have got that so we can say positively that tea can be produced for about 16 cents a pound with the labor conditions he has there. The problem, so far as he is concerned, is settled under his conditions there; but there is a large element of philanthropy in his work which must be eliminated on a purely commercial investment.

Dr. Shephard has this garden, and as it develops within the next few years he will probably have a yield of 15,000, maybe 20,000, pounds of tea; and if he gets up to 20,000 pounds it will be a paying investment.

The CHAIRMAN. How many people has he working for him?

Mr. GALLOWAY. He has about forty children and probably the men from ten or fifteen families. He schools them. Here is a picture which shows his school, and the children that pick the tea are the children he sends to school every day. They are a well-educated, polite set of little colored people. The work he is doing there, from that standpoint alone, is of exceeding interest to anyone who goes down there. The work down there has been of great value in this way. When it was inaugurated we had no knowledge whatever as to how tea should be planted in order to meet the conditions in this country. Consequently tea was planted on the high ground; it was planted in the lowlands; it was also planted in white sandy soil and in heavy clay.

The CHAIRMAN. In other words, he was making experiments himself?

Mr. GALLOWAY. He was making experiments himself. This photograph shows almost pure white sand. Then there are other plantations that are planted in the pine-wood swamps of black, mucky soil. Here is another picture that shows it almost on pure sand. The result of all this work has been expensive, but has resulted in showing the best teas, contrary to the original idea, can be grown on low, drained mucky lands. The land, of course, has to be drained before the tea can be put in there, but after it is put in we can get the best tea and highest yields from these spots. There is one particular garden planted on a piece of ground of that kind yielding about 400 pounds of finished tea per acre. If it could all be brought to do that, that would mean for the plantation a very handsome yield. Of course that can not be done under this experimental condition. Aside from the cultural conditions, there are questions as to the methods of feeding, the methods of pruning, the methods of picking. Then comes the most important of all, the methods of handling after the tea is picked. Upon that depends largely the success of the work, just as it is in tobacco growing. You may grow a good grade of tobacco, and unless it is handled properly you may lose it all.

Our scientific work has been wholly in the direction of discovering methods which would throw light on the fermentation of the tea. As a result of that we are making there fine grades of green tea, oolong, and black. This year we had the various lots grown tested, and a price fixed on the tea. The prices range all the way from 40 cents a pound to $5 a pound. Teas are grown down there that will bring on the market probably $5 a pound. I have here a sample of green tea that will probably bring about $1 or $1.50.

The CHAIRMAN. Grown down there?

Mr. GALLOWAY. Grown down there.

The CHAIRMAN. If he could get $1.50 a pound he does not need much governmental care.

Mr. GALLOWAY. That is only a limited amount. The main bulk of his tea he puts up he puts up in this size lots for about 40 cents.

The CHAIRMAN. At that price it ought to be lucrative, ought it not?

Mr. GALLOWAY. Yes; the cultural side of the thing now down there is practically finished, but there are questions connected with the fermentation of the tea.

The CHAIRMAN. As to the fermentation, have you had anybody from China to look into it?

Mr. GALLOWAY. No, sir.

Representative HENRY. What makes the difference in color between the green and the black?

Mr. GALLOWAY. Teas, strictly speaking, are divided into three classes, the black, the oolong, and the green.

Representative SCOTT. What does oolong mean?

Mr. GALLOWAY. Oolong means half fermented tea. Black means wholly fermented tea, and green means tea that is not fermented at all.

Representative ALLEN. The green is the highest order of tea, is it not?

Mr. GALLOWAY. It altogether depends on taste. All these blends, like English breakfast tea and things of that sort, are simply names. We can pick down there a tea that consists of simply little buds, little tips, that would sell for $10 a pound, but it would cost $5 a pound to get that. There is no demand in the market for it.

I do not want to go into a discussion on how the tea is handled, but it is an exceedingly interesting process, and if you care to listen to it I will tell the whole operation.

Representative ALLEN. Go ahead.

The CHAIRMAN. This sample you have handed me does not seem to have the bouquet of the foreign tea.

Mr. GALLOWAY. I think it has. The bouquet of the foreign tea is largely artificial. Dr. Shephard puts in some of his tea the flowers of the sweet olive, which give it a very rich bouquet.

The teas are picked in the morning by the little children. They bring it in in baskets. The leaves are then spread out on immaculate floors in the factory and the leaves are allowed to wither. The time of withering depends altogether on the day. Sometimes it will take only an hour and sometimes two hours and sometimes three hours. If it is a clear, bright, sunshiny day it will take only about two hours to wither. When it reaches a certain elastic condition it is lifted and put into rollers. The rollers are all worked by machinery—by steam. The hand does not touch it at all. If we wish to make black tea, after it is sufficiently rolled it is spread out on the fermenting tables in another immaculately clean room. Nobody goes in there even with a hat on. The tea is spread out and permitted to ferment until the men determine by the appearance of it that it is black. The look and smell determine that, but it is still wet and juicy. When that point is reached it is run into the drying room, and there is a machine that dries the tea.

It is like a part dryer; and when it comes out it is a finished tea, except that it has to be assorted and picked and sifted.

If it is made into oolong tea it is only allowed to go to a certain point in this same process, and then stops. If it is made into green tea it is not fermented at all, but is carried directly from the rollers and put into this cannon-like machine here [indicating], which is another invention of Dr. Shephard's. It is the only thing of the kind in the world, and he has kindly turned it over to the Department so we could protect it. The machine is a revolving sheet-iron rifled cylindrical arrangement. The tea is put in here and it works down. As it works down a blast of hot air goes through and kills the fermenting agent, so that we can pick tea in the morning and can have finished green tea for luncheon, if you want it, at noon.

The CHAIRMAN. Ready to ship; dry enough to ship?

Mr. GALLOWAY. Yes. It can be picked in the morning and be in the New York market in thirty-six hours.

The CHAIRMAN. What further is there for you to do there?

Mr. GALLOWAY. We are not going to do much more work there. It is going to cost us about $2,500. That is all we are spending there this year—$2,500 or $3,000. We want to continue this work on the ferments of tea. That is all to be carried on by one of our experts who is in charge of the business; but we want him to determine how to develop the finest bouquets in these teas, just as has been done in tobacco to a certain extent, and what has not been done in other countries. In China they do not know anything about it. They simply do it by rule of thumb. If we can discover the laws which govern the action of these engines, these ferments, if we can utilize the ferments in the fermentation of teas in other places, we have solved a problem that the people in India have been struggling over for the last twenty-five or thirty years.

Representative ALLEN. What will be the benefit of it?

Mr. GALLOWAY. It will enable us to increase the value of our teas by increasing the aroma if we can understand the operation of the ferments.

Representative ALLEN. Artificial aroma?

Mr. GALLOWAY. No; it would be the aroma of the plant itself, but we will be able to take it out. If I may make a rather crude comparison, it would be like taking the digestive fluids from the stomach of an animal and giving them to a man to increase his digestive powers. It is simply an artificial means of increasing the fermentive action of a substance that is all in the leaf itself.

Of course, in addition to that, there are certain machines that must be perfected if we are to compete. We have to compete by means of perfecting machinery. This is a case right here in point. Until this year we never knew how to get this peculiar grayish cast to tea. The Chinese know, but we have never been able to find out how it was done.

Representative HENRY. They have a bright green color.

Mr. GALLOWAY. They do it in two ways. They do it by chemicals in some cases. They use prussian blue and other things, but there is a way to do it and not use anything at all. That was discovered accidentally this year, and it has pointed the way, if we can get the right machine, to increase the price. It will not improve the taste of the tea, because it is not a question of taste, but a question of price based on the look of the thing. We have got to compete with foreign products; but this year Dr. Shephard had a lot of tea left over, and he told one of the men to put it in one of the sifters and sift it. The man forgot it. When it went in there it was black, but when he went back a couple of hours afterwards to look at it, it had this whitish cast, and it was all done by the operation of rubbing it on itself. We got a Chinaman down there, with a view to finding out how this was done. He insisted on working out by himself. He would not work with anybody else; and he did prepare some tea of this kind, but he prepared it one day when Dr. Shephard was not looking at him, and when the doctor asked him to explain it he refused and went off and left. That, probably, is the way he did it. He had an iron bowl there and he had been rubbing it with his hands. That is the way they do it, in all probability. We have got to get a machine that will handle that tea without breaking it up and yet will have weight enough to bring about this peculiar whitish cast.

We carried the thing further. There was considerable controversy between Dr. Shephard and Dr. True as to just how this thing was brought about. Dr. True illustrated the thing by taking black beans and rubbing them around on each other, and they turned gray. It is the scratching of the surface.

The CHAIRMAN. It is a mere surface that is exposed?

Mr. GALLOWAY. Yes; it is merely a mechanical operation.

The CHAIRMAN. The outer surface is rubbed off and the inner surface comes to the front?

Mr. GALLOWAY. Yes. That may mean 10 or 15 cents more a pound on the tea—just the look of it.

Representative HENRY. What is this English breakfast tea?

Mr. GALLOWAY. Here is an Oolong.

Representative HENRY. Is that a black tea?

Mr. GALLOWAY. No, sir; that is half black. There is another interesting part, and that is tea grown under shelter will give a product three to four times as valuable as that grown in the open.

The CHAIRMAN. The same as tobacco?

Mr. GALLOWAY. The same as tobacco.

We want to do the work in the two additional States, and the amount estimated, $15,000, shall, I think, be all we need. It will enable us to establish two stations, one in the southern part of Texas and one either in Alabama or Louisiana, where the conditions are altogether different from what they are in Summerville. We will probably have to get other varieties of tea. There are about thirty or forty varieties now at Summerville.

The CHAIRMAN. How much more money do you want spent at Summerville?

Mr. GALLOWAY. We will spend there probably this next year from $2,000 to $2,500.

The CHAIRMAN. In what way?

Mr. GALLOWAY. Not anything in the nature of demonstrative work, but in the perfection of machinery. We have got to use that for the highest class of our work, and utilize the machinery developed in these other places.

Representative ALLEN. Professor, if he has discovered the process, and it is a mere production of machinery, ought he not to produce that himself?

Mr. GALLOWAY. He has put a good deal more money into it now than the Government has.

Representative ALLEN. Do you propose to leave the machine there?

Mr. GALLOWAY. No, sir; I do not.

The CHAIRMAN. Of course this machinery will be useful anywhere?

Mr. GALLOWAY. Certainly.

Representative HENRY. What about that Boston enterprise, doctor?

Mr. GALLOWAY. Based on the success that has been secured in Dr. Shephard's place in these low grounds a company has been formed, and they are putting tea out on the rice lands in South Carolina, where it does not cost anything to clear the land at all. There are about 2,000 acres there now.

The CHAIRMAN. What are they doing?

Mr. GALLOWAY. Planting tea. It will be about four years before the plants yield. They begin to yield the second year.

Representative SCOTT. What is the life of a tea plant?

Mr. GALLOWAY. It will live indefinitely. You can continue to pull off the leaves indefinitely and it will come up again. The plants here are plucked about every two weeks. They get over the whole thing about every two weeks.

Representative SCOTT. Through how long a season?

Mr. GALLOWAY. From the first of April until the middle of October.

The CHAIRMAN. Do they have to manure them at all?

Mr. GALLOWAY. Of course manuring is essential, but on the low grounds it is not so important. Water is the prime factor, because every time you can bring water on you get what is called a flush; that is, a new crop of leaves, and then you can pick every ten days. That is why irrigation would be better than depending on rainfall.

The conditions we set forth in our cooperative plan are something like this. This is simply a rough draft of what I furnished the men when they went to Texas:

MEMORANDUM OUTLINING PLAN FOR TEA WORK IN TEXAS.

The following skeleton outline is proposed for plan of work to develop the tea industry in Texas or such other States as may be thought desirable:

1. Land to be furnished to the Department free of charge under a guaranteed lease of not less than ten years.
2. Such labor as may be necessary in clearing the land and putting it into condition for planting tea to be furnished to the Department free of charge.
3. Teams and ordinary farm implements, such as plows, harrows, etc., to be furnished to the Department free of charge.
4. One-half the cost of all ordinary labor necessary in establishing and maintaining 50 acres of tea plants to be furnished the Department free of charge.
5. All buildings necessary for the work to be furnished to the Department free of charge.
6. The Department will furnish an expert superintendent who has had experience in growing and manufacturing tea.
7. The Department will furnish all necessary machinery used in the manufacture of tea.
8. The Department will furnish all seeds and plants.
9. The Department will pay one-half the cost of ordinary labor necessary for the growing of plants and the handling of the product.
10. The product from the gardens will become the property of the donors of the land, but will be handled and sold subject to conditions which may be mutually agreed upon.

The tea gardens should be located with due respect to soil, climate, rainfall, and labor, particularly colored labor. The plans should be so made as to begin with not less than 50 acres, with possibilities of extending to 100 acres within a few years, if it is thought best. The buildings required for the first two or three years will be small. After that, when the tea begins to come in in quantity, a suitable factory building will have to be erected. Such a building for a 100-acre plantation will not probably cost more than $1,500. The full equipment of such a building with machinery, etc., for the handling of the yield of 100 acres will probably cost from $4,500 to $5,000. This portion of the expense will be borne by the Government.

Representative ALLEN. Professor, were there many investigations down there? Did people come to examine and see into the practicability of this culture in that part of the country? Do you think it will develop an interest in that part of the country?

Mr. GALLOWAY. I think so. I think the number of people who go there to Summerville is increasing. They are mainly from portions of the South, and are people who are interested in the utilization of colored help, especially children. We have pointed out that there are to be nothing like large fortunes made in tea growing, but that it can be made a profitable industry in certain regions.

The CHAIRMAN. Where the labor is cheap?

Mr. GALLOWAY. Where the labor is cheap, as a means of diversifying agriculture in certain parts of the South.

The CHAIRMAN. I notice that a company has been formed to utilize lands down South.

Mr. GALLOWAY. That is at Charleston. They have about 2,000 acres there and they are putting out the tea just as fast as they can get the plants.

The CHAIRMAN. Have you anybody on that project on the lump sum by the year?

Mr. GALLOWAY. Yes; we have a man who was on as a scientific aid who went to Dr. Shephard's place and learned the business. Now he is on the permanent roll at $1,000 a year.

The CHAIRMAN. He is paid from the lump-sum roll?

Mr. GALLOWAY. From the lump-sum roll. He is a man we shall put in Texas to superintend the work if we start it there. The expert work, such as the investigation of the ferments, will be done by other officers of the Bureau, who are paid out of other funds of the Bureau.

Representative ALLEN. What is the programme in Texas? What is the arrangement?

Mr. GALLOWAY. The Texas arrangement is just what I have read. That applies to Texas.

Representative ALLEN. I thought you were reading about Shephard?

Mr. GALLOWAY. No; that applies to Texas. It is particularly along that same line. He turns over to us his whole plantation for scientific purposes. We make such scientific investigations as may be decided upon, and he furnishes us laboratory facilities, house facilities, and labor. We experiment with the necessary machinery, and the machinery becomes the property of the Government when perfected.

Representative ALLEN. Who is Dr. Shephard?

Mr. GALLOWAY. Dr. Shephard is a gentleman who did much to develop the phosphate industry of the South. He is a man who has lived in Charleston a good many years, and went into this tea work largely for the purpose of encouraging the utilization of colored help in the work, and did it largely, as I understand, for philanthropic purposes.

Representative ALLEN. Where is he from?

Mr. GALLOWAY. I think he is from Charleston. He has lived there about thirty years. He developed the phosphate work in Florida and other Southern States.

Representative ALLEN. Is he a man of considerable means?

Mr. GALLOWAY. Yes. I have here some samples of the new teas of the lower grades. I will leave them for trial.

The CHAIRMAN. Have you a sample of the best black tea there?

Mr. GALLOWAY. No, I have not; but I left a sample on your desk. I will send you gentlemen each a package of three types—that is, the best black, the best green, and the best Oolong.

Representative SCOTT. What is the highest perfection?

Mr. GALLOWAY. The green usually brings the highest price. There are very few people who can distinguish between these higher grades of teas. There is about $12,000,000 worth of tea imported into this country at about 12½ cents average. That means tea with a large amount of tannic acid present. That is the easiest kind of tea to make. You can pick it any time and grow it from any bushes, and you can make it for 7 or 8 cents a pound.

Representative HENRY. That tea retails for about 40 cents, does it not?

The CHAIRMAN. You can buy good tea for 39 cents.

Mr. GALLOWAY. The idea we are trying to develop, and what we are trying to cultivate is that we are making a high-grade, distinctively American tea. It is not Ceylon tea nor Chinese tea, but it is a distinctively American tea, and we are trying to cultivate a taste for it.

I believe that is about all, Mr. Chairman, I have to say on the tea proposition.

The CHAIRMAN. Now we will take up the great seed question. I do not suppose there is much to tell us on that, Doctor.

Mr. GALLOWAY. No. I would simply like to say this, that we are endeavoring to change this about as much as we can with a view to making it of value to the country.

The CHAIRMAN. Making it useful?

Mr. GALLOWAY. Making it useful; and of the first things that we have done in that direction, one of the most distinctive steps, I think, has been accomplished this year, and I can briefly state what that is.

There is being developed all the time all over this country new varieties of vegetables and new varieties of other things, and they have only local interest, because they never get beyond a certain little narrow sphere. We are endeavoring to collect those things. Mr. A has a special kind of tomato that may originate on his place. He has only a limited quantity of it. That eventually would go into the hands of a seedsman, or he may keep it for many years before he lets it out. We are trying to get hold of those things as novelties and specialties. We are trying to make tests of them through the experiment stations, and then, by working two or three years in advance, we will send out these things under the name of novelties, but only send them out one year or two years, and then simply state that this particular thing, if found valuable, can be secured from seedsmen. We have secured for this next year's distribution 500 packages for each Member and Senator of those novelties, and in order to do that properly we have divided the country into districts. We do not send the same novelties into one district that we send into another district, but we would send a collection, say, of 500 packages, each package containing 5 packets, to all the Members and Senators in one district, and they will have a chance of comparing them with the old things they have and see if they are valuable.

For this year we have been only able to get things that are in the markets, but as novelties. They have not reached general distribution as yet. There is a little circular in each package, stating just what the novelty is and what it is expected to do, and calling attention to some of its points.

We are going back in that way to the original intent of the law, to distribute only things that have some value. This year we have 500 packages out of a total of 12,000 packages. Next year we can raise it to 1,000 or 2,000 packages, and increase it every year.

The CHAIRMAN. Cutting down the others all the time.

Mr. GALLOWAY. Yes; cutting down the others all the time. What we need is to work in advance. It costs little more to grow these novelties than the common vegetables, provided we have sufficient time to do it.

Representative SCOTT. It has always struck me that the only proper function of the Department in the matter of sending out seeds was to send seeds that people could not find in the market.

Mr. GALLOWAY. These things are not in the market generally. For instance, when we start on a new tomato this year there may not be more than 100 pounds in the country. We will take that 100 pounds and ask a man to grow 1,000 pounds for us next year.

By means of purchasing seed ourselves instead of going to the contractor we have been able to save sufficient money to devote a considerable portion of it to what we call special seeds, such as tobacco, cotton, the forage crops, the sugar beets, sorghum, and seed of that character.

The CHAIRMAN. You are not growing all your own seed now?

Mr. GALLOWAY. No; we do not grow it, but we do not contract with one man to furnish it all. If we find, for example, that a certain firm in Richmond has a stock of seed that is best adapted to the South we will get that seed from one man.

The CHAIRMAN. Is all your seed shipped here?

Mr. GALLOWAY. All our seed is shipped here, only we buy it all in bulk. It is shipped here, and we simply contract for the purely mechanical part of the work.

The CHAIRMAN. You have not reestablished that seed division?

Mr. GALLOWAY. No; we have nothing of that kind. The contractor employs all his own labor. It cost us $40,000 or $50,000 this year to do the mechanical part of the work, but it all has to be done by machinery. We have machines that pack 500,000 packets a day. We have to run out 39,000,000 between now and the 1st of April, so we have to move along. We are increasing the mechanical work, because the novelties make a distinct line. The contractor has to stop on that and he has to stop for each section. The man who does the contract work is not a seedsman at all. He is simply the inventor of the only machine in the country that does the work. We do all the expert work ourselves. Every sample that comes to us and every lot, no matter if there are five lots of the same variety, we make a test of it, and all that work is done on the flats.

The CHAIRMAN. According to your contract with these people, that seed has to be delivered to you when?

Mr. GALLOWAY. At different times. We contract for corn to be delivered between the 15th and last of December.

The CHAIRMAN. You can not make these tests outside in December?

Mr. GALLOWAY. We test for vitality inside, but we test for trueness to name outside. We are obviating the necessity for testing now, because we buy our own seed. Then we send our men right to the very places where the seed is being grown. They see it there, and are enabled to determine on the spot that it is the seed we have contracted for. For example, our men go into the melon regions of Nebraska when melons are being grown. We know the man who is growing the seed for us. We know the man we get it from.

On these special seeds like tobacco we district the country in the same way. We send different seed to Mr. Henry's district, for example, than we would send into some other district. We would send the Sumatra seed there and to another district in Kentucky some other variety. What we are endeavoring to do with tobacco is to get pure types. It is a very hard thing to do. Tobacco as we get it from seedsmen or even special growers has wide variation, and one of the things we are endeavoring to do is to fix the types and distribute fewer types. That is one of the things we are going to do, so that people who get those seeds will have the pure things, and in order to fix the types we want to do experimental work in cooperation with a number of stations. You will notice a word put in there—"testing"—"for the purchase, propagation, testing, and distribution of valuable seeds." That is simply to enable us to make these necessary tests, to determine when a thing——

Representative HENRY. The word "testing" has not been in before?

Mr. GALLOWAY. No.

Now, the cotton seed distributed will in a few years be absolutely new varieties. The seeds of forage crops will be of the same nature and the seeds of wheats will be of the same kind, originated through our plant-breeding work.

The CHAIRMAN. You ask for $280,000. I do not think there is much wish on the part of Congress to increase the appropriation, but if you want $10,000 more for the rare and valuable seed business, I think we can make that $30,000, which would put the amount at $270,000.

Mr. GALLOWAY. That is all we want.

The CHAIRMAN. About how many packages will that give each member; 12,000?

Mr. GALLOWAY. Yes. This year you gave us authority to put up a building for $10,000. We put up that building for $10,000, and it will give them practically as many packages as they had before. That is, that represents the economy of buying our own seed, so that next year we will be probably $10,000 better off, because we will not have to put up a new building. What we want is $10,000——

The CHAIRMAN. We can keep the total at $270,000 and make the $30,000 available for that purpose out of it. How much would that $10,000 additional make our quota?

Mr. GALLOWAY. It will be reduced a little on the question of novelties. That is, we can not get in as many, but I think it will be 12,000 packages, anyway, without any doubt.

The CHAIRMAN. That is a sufficient quota, I think.

Representative SCOTT. Oh, yes.

Mr. GALLOWAY. There is one point I probably had better touch on. It has been our plan to reserve a large portion of this seed for the Secretary.

The CHAIRMAN. That has always been done.

Mr. GALLOWAY. It has never been done as much as it might have been done; that is, the law allows a third. The reason we do that is this: There are certain members that must have more seed than others. The Secretary then has the right to make those transfers, and thus satisfy the members needing large amounts.

The CHAIRMAN. What do most of the city members do with their seed?

Mr. GALLOWAY. We have made a new arrangement on that proposition which has rather interested them. This year, instead of sending city members the ordinary seed we are sending them seed particularly suited for nature-study work in the public schools, and we now have about sixty city members on our list who are going to receive such seed. We give them the option of trading package for package the vegetable seed for flower seed. That enables us to give more packages of vegetable seed to the Southern members, who want such seed. We have also prepared for the city members a few packages of seed suitable for small dooryards. That is flower seed; but the nature-study work we are emphasizing particularly.

Representative SCOTT. The allotment this year is 12,000 for each Member and Senator, is it not?

Mr. GALLOWAY. Yes; 12,000, and 500 of the novelties.

Representative SCOTT. That accounts for something over 5,000,000 packages, and there will be 8,000,000 packages.

Mr. GALLOWAY. About seven million and some hundred thousand; yes, sir.

Representative SCOTT. The remainder are reserved for the Secretary?

Mr. GALLOWAY. Yes; the Secretary gets something over a million and a half.

Representative SCOTT. That still leaves a million and a half. What becomes of them?

Mr. GALLOWAY. Did you multiply that by 430?

Representative SCOTT. Four hundred and forty-seven, counting the full number of Senators and Representatives.

Mr. GALLOWAY. Each Member and Senator has 12,000 packages.

Representative SCOTT. That makes 5,364,000.

Mr. GALLOWAY. Did I say the Secretary reserves a third? It is not exactly a third. There are about seven million and some odd thousand total. This is the best way to get at it. There will be 39,000,000 packets, to my recollection, divided by 5. That will be the number of packages.

Representative SCOTT. That is 7,800,000.

Mr. GALLOWAY. That includes the flower seeds, but there are over a million of the flower seeds. There are just a little over 7,000,000 of the vegetable seeds. The Secretary has about a million and a half, and he had about a million last year.

Representative ALLEN. Do you dispose of all of them?

Mr. GALLOWAY. Every one.

Representative SCOTT. I sent out 20,000 last year.

Mr. GALLOWAY. These little pamphlets show the districts. That shows our method of distribution. Here are the little circulars we send out with the novelties. That goes inside of each package and describes the novelties.

Mr. Chairman, that item there of $43,000 for labor in the city of Washington——

The CHAIRMAN. That is $50,000.

Mr. GALLOWAY. If you will make it $50,000, it will be satisfactory.

The CHAIRMAN. You will not need those clerical increases in the other places, then?

Mr. GALLOWAY. No. I did not know they put that in. It has not been marked in italics.

The CHAIRMAN. It was $43,000 last year?

Mr. GALLOWAY. Yes, sir.

So much for the Congressional distribution. We keep, to a certain extent, distinct the work on the introduction of seeds from foreign countries; but under the reorganization we have the same man in charge of both branches.

The CHAIRMAN. I want to take up that list of salaries. One botanist, $2,250.

Mr. GALLOWAY. That man is in charge of both the Congressional seed work and the seed and plant introduction work.

The CHAIRMAN. The superintendent at $2,000. I would not transfer any of these to the lump sum.

Mr. GALLOWAY. I think that botanist might be transferred, because he is a permanent officer, and I think the rest had better stand as they are.

The CHAIRMAN. When you put him on the statutory roll, you had better say, "one botanist in charge of Congressional seed distribution."

Mr. GALLOWAY. Yes.

The CHAIRMAN. So that it will locate him definitely.

Mr. GALLOWAY. Yes. He is in charge of Congressional seed distribution and of seed introduction work. That is his title.

The CHAIRMAN. And the superintendent?

Mr. GALLOWAY. I think the superintendent ought really to remain temporary.

The CHAIRMAN. Inspector?

Mr. GALLOWAY. It is the same there.

The CHAIRMAN. One expert, at $1,200. One expert, at $2,000. What is the one at $2,000?

Mr. GALLOWAY. That is a man temporarily employed in this seed and plant introduction work. He is an explorer.

The CHAIRMAN. One expert, at $1,200.

Mr. GALLOWAY. That is a man in charge of the propagating plants I described a while ago, and I said he was working in gardens and grounds.

The CHAIRMAN. Another expert at $1,000.

Mr. GALLOWAY. I do not know what that is. I do not recall it.

The CHAIRMAN. You have three experts, one at $2,000, one at $1,200, and one at $1,000.

Mr. GALLOWAY. Those are men, Mr. Chairman, all connected with the foreign seed and plant introduction work.

The CHAIRMAN. They are paid for really from that $30,000?

Mr. GALLOWAY. From that $20,000. We set aside about $8,000 of that for salaries, and this is not shown at the end here.

The CHAIRMAN. One clerk here, at $1,800; one clerk, at $1,600; one clerk, at $1,400; three clerks, at $1,200; one clerk, at $1,000.

Mr. GALLOWAY. Two of those clerks are connected with the Congressional seed work proper.

The CHAIRMAN. Which one?

Mr. GALLOWAY. One of them is Mr. Wight, who has been there with it for the last thirty-five years, ever since the thing has been going on. He handles all our accounts.

The CHAIRMAN. That is the $1,800 man?

Mr. GALLOWAY. That is the $1,800 man. Is there a $1,600 man?

The CHAIRMAN. Yes; and a $1,400 man, and three at $1,200.

Mr. GALLOWAY. I can not tell, Mr. Chairman. These things are just like the case was yesterday. I can not tell until I get our rolls together, and I will submit that to you with the rest. I can not tell what they are without having our own pay rolls here with us.

The CHAIRMAN. One packer, at $840; one laborer, at $780; nine laborers, at $720.

Mr. GALLOWAY. Those laborers are men who are identified with the packing of plants, and are detailed most of the time on gardens and grounds to do the work over there.

The CHAIRMAN. But you have laborers there?

Mr. GALLOWAY. Yes; but they are not enough for this other work. I do not say the laborers on gardens and grounds who are doing seed work.

The CHAIRMAN. These men that are charged as laborers on the seed roll have to do what? There are quite a lot of them.

Mr. GALLOWAY. There are men there, Mr. Chairman, who have to handle——

The CHAIRMAN. There are twenty or thirty laborers.

Mr. GALLOWAY. Yes; a good many of them are frank counters.

The CHAIRMAN. You consider them laborers, do you?

Mr. GALLOWAY. Yes; carloads of seed come that have to be handled and stored, and all those things are done by what we call laborers.

The CHAIRMAN. Are your counters women or men?

Mr. GALLOWAY. Women.

The CHAIRMAN. What do those women do when you do not need them?

Mr. GALLOWAY. We let them off usually.

The CHAIRMAN. Usually?

Mr. GALLOWAY. I will give you a list of all of these people—just what they are doing—so that you can see what their duties are, if you want it.

The CHAIRMAN. One laborer, at $420; two laborers, at $360; three laborers, at $150.

Mr. GALLOWAY. Some of those people are working on the flats. We have half a dozen people down there classified as laborers. There are some young men from colleges who are classified as laborers, although they are not laborers. They work on the Arlington farm, but we pay them out of the seed fund. When they work on the flats we pay them out of the seed fund. I can say this offhand, that there is not a person on the seed roll in the laborers' class that is not essential. We have weeded them out this last summer until we have got down to where we really have not enough people.

The subcommittee thereupon adjourned until Wednesday, December 10, 1902, at 10 o'clock a. m.

COMMITTEE ON AGRICULTURE,
HOUSE OF REPRESENTATIVES,
Washington, D. C., December 10, 1902.

The committee met at 10 o'clock a. m., Hon. J. W. Wadsworth in the chair.

The CHAIRMAN. Gentlemen, the Secretary of Agriculture has come before us in regard to an emergency appropriation to stamp out the outbreak in the foot and mouth disease which has taken place in New England, and also in reference to an act giving him further powers. Mr. Secretary, we will hear you if you are ready.

Secretary WILSON. Judge Springer, who was the attorney in a case with regard to this question of the right to move animals from one State to another, is entirely familiar with the whole case. He argued the case in the Supreme Court, I believe; did you not, Judge?

Mr. SPRINGER. Yes, sir.

Secretary WILSON. And he has prepared a proposition to cure the difficulty along those lines. I am ready to talk to you about the foot and mouth disease, but on that particular point I think the Judge is the best authority we have, and it would be wise to hear from him.

The CHAIRMAN. You would rather we should hear from him first?

Secretary WILSON. Yes; on that question.

The CHAIRMAN. Very well.

STATEMENT OF HON. WILLIAM M. SPRINGER.

Mr. SPRINGER. Mr. Chairman, I am much obliged to the Secretary and to the committee for this courtesy.

At the instance of the National Live Stock Association, and as their general counsel, I appeared in the Supreme Court of the United States in the case of Ed. H. Reid *v.* The People of the State of Colorado, recently argued and decided in the Supreme Court. That case involved the constitutionality of the inspection laws of the State of Colorado.

Reid was a shipper of cattle. He had a herd of 800 and odd head, which were in Texas, and he proposed to ship them through Colorado into Wyoming. He applied to the Bureau of Animal Industry and obtained a permit or certificate showing that his cattle were free from every disease, and that they were entitled to be taken into any State or Territory of the Union or to foreign countries, without any further inspection or payment of fees. He was stopped on the border of Colorado and subjected to an inspection and a charge of fees for the inspection. He refused to pay; he was arrested under the laws of Colorado, tried criminally, and found guilty. He was sentenced to six months' imprisonment, I believe, and to pay a fine of $200 or $300. The supreme court of Colorado affirmed the judgment of the lower court. He sued out a writ of error to the Supreme Court of the United States.

The Supreme Court of the United States handed down an opinion a few days ago in that case. It is entitled "Ed. H. Reid, Plaintiff in Error, *v.* The People of the State of Colorado." The opinion was handed down December 1, 1902. Mr. Justice Harlan delivered the opinion of the court, and it was a unanimous opinion except that Mr. Justice Brewer dissented, and his dissenting opinion is not printed.

The Supreme Court affirmed the judgment of the supreme court of Colorado upon the ground that the law known as the act creating the Bureau of Animal Industry only went to the extent of providing for the suppression and extirpation of pleuro-pneumonia and other contagious diseases in cattle and other live stock, but that it did not contemplate the issuing of certificates by the Secretary of Agriculture through the Bureau of Animal Industry which would entitle cattle having that certificate to go into other parts of the country.

In other words, that it was not a regulation of interstate commerce, and while the power to make such a law was conceded by the court, it was said that Congress had not done so, and the court could not extend by construction the provisions of the law. This opinion is before me, and I think it would be very well to have it printed. I can give you this copy.

The CHAIRMAN. Very well; just pass it up to the stenographer.

Mr. SPRINGER. It will be very useful to your members.

The opinion referred to is as follows:

[Supreme Court of the United States. No. 269, October term, 1902. In error to the supreme court of the State of Colorado. Ed. H. Reid, plaintiff in error, *v.* The people of the State of Colorado. (December 1, 1902).]

Mr. Justice Harlan delivered the opinion of the court.

The plaintiff in error was convicted in the district court of Arapahoe County, Colo., and sentenced to confinement for six months in the county jail for a violation of the second section of a statute enacted March 21, 1885, to prevent the introduction of infectious or contagious diseases among the cattle and horses of that State. (Sess. Laws, Colo., 1885, p. 335.)

The judgment was affirmed by the supreme court of the State, and the case having been brought here, it is insisted that by the final judgment the accused has been denied a right specially claimed by him under the Constitution of the United States.

This position depends upon the inquiry whether a certain act of Congress, to be presently referred to, has the scope and effect attributed to it by the accused, and, that contention failing, whether the statute under which he was convicted is repungent to that instrument.

After reciting that certain infectious and contagious diseases, known as the Texas or splenic fever, Spanish itch, and other diseases of a dangerous and contagious nature, were prevalent among cattle and horse stock in the States and Territories south of the thirty-sixth parallel of north latitude, and that it was essential for the protection of the cattle and horses of Colorado to prevent the introduction and spread of all such diseases within that State, the above statute provided:

§ 1. It shall be unlawful for any person, association, or corporation to bring or drive, or cause to be brought or driven, into this State any cattle or horses having an infectious or contagious disease, or which have been herded, or brought into contact, with any other cattle or horses laboring under such disease, at any time within ninety days prior to their importation into this State.

§ 2. It shall be unlawful for any person, association, or corporation to bring or drive, or cause to be brought or driven, into this State between the first day of April and the first day of November any cattle or horses from a State, Territory, or county south of the thirty-sixth parallel of north latitude unless said cattle or horses have been held at some place north of the said parallel of latitude for a period of at least ninety days prior to their importation into this State, or unless the person, association, or corporation owing or having charge of such cattle or horses shall procure from the State veterinary sanitary board a certificate, or bill of health, to the effect that said cattle or horses are free from all infectious or contagious diseases and have not been exposed, at any time within ninety days prior thereto, to any of said diseases. The expense of any inspection connected herewith to be paid by the owner or owners of such cattle or horses.

§ 3. Any person violating the provision of this act shall be deemed guilty of a misdemeanor, and shall, on conviction, be punished by a fine of not less than five hundred dollars, nor more than five thousand dollars, or by imprisonment in the county jail for a term of not less than six months, and not exceeding three years, or by both such fine and imprisonment.

§ 4. If any person, association, or corporation shall bring, or cause to be brought, into this State, any cattle or horses, in violation of the provisions of sections one or two of this act, or shall, by false representation, procure a certificate of health, as provided for in section two of this act, he or they shall be liable, in all cases, for all damages sustained on account of disease communicated by or from said cattle or horses; judgment for damages in any such case, together with the costs of action, shall be a lien upon all such cattle and horses, and a writ of attachment may issue in the first instance without the giving of a bond, and the court rendering such judgment may order the sale of said cattle or horses, or so many thereof as may be necessary to satisfy said judgments and costs. Such sale shall be conducted as other sales under execution. (Sess. Laws, Colo., 1885, p. 335.)

There was no proof in the case that the particular cattle in question had any dangerous, infectious, or contagious disease. But it did appear that after being kept a long while in Lubbock and Cochran counties, Tex., south of the thirty-sixth parallel of north latitude, these cattle were shipped on the 20th day of June, 1901, to Denver, Colo., on their way to their ultimate destination in Wyoming, without being first inspected as required by the statute of the former State.

The provisions of the Colorado statute were ignored altogether as invalid legislation. Being asked by one of the witnesses whether he had or not allowed the State board of sanitary inspection to inspect the cattle, or whether or not he had procured from the State veterinary sanitary board a certificate or bill of health to the effect that the cattle were free from all infectious or contagious diseases, the defendant said:

The State board of sanitary inspection, through one of their inspectors, had inspected the cattle against his will and desire, but that he had not obtained from the board any certificate or bill of health whatsoever. But he said that he immediately theretofore had had the cattle inspected by a duly authorized inspector of the Bureau of Animal Industry of the United States, at Hereford, in the State of Texas, and had obtained a certificate from him to the effect that the same were free from any infectious or contagious disease; that the reason he could not get a certificate or bill of health from the State board of Colorado was because he would not pay the expense of such inspection, and because he had opposed such inspection as unnecessary and without any warrant in law.

When refusing his assent to the State inspection, Reid showed to the State authorities what he called a "United States certificate."

The certificate was signed by "Arthur C. Hart, assistant inspector, Bureau of Animal Industry." That officer certified that he had carefully inspected the cattle in question at Hereford, Tex., and found them "free from Texas or splenetic fever infection (Boophilus bovis) or any other infectious or contagious disease," and that "no Texas-fever infection is known to exist where they have been kept or on the trail over which they have passed." Below the signature of the assistant inspector was the following unsigned printed memorandum:

Animals which have been inspected and certified by an inspector of the United States Bureau of Animal Industry and are free from disease have the right to go into any State and be sold for any purpose, without further inspection or the exaction of fees.

The above, together with certain published regulations prepared and issued by the Bureau of Animal Industry, was all the evidence in the case.

The defendant asked the court to instruct the jury:

That it was unnecessary for the defendant to procure from the Colorado Veterinary Sanitary Board a certificate or bill of health to the effect that his cattle were free from infectious or contagious diseases and had not been exposed at any time within ninety days prior thereto to any of said diseases, for the reason that the cattle had previously been inspected—

> according to the statute of the United States, in such case made and provided, and according to the rules and regulations pursuant to said statute, promulgated by the Department of Agriculture, by a duly authorized inspector of the Bureau of Animal Industry of the United States stationed at Hereford, in the State of Texas, and had been duly certified by such United States inspector to be free from any infectious or contagious disease, and for the further reason that he, the said defendant, then and there exhibited and showed to the said State inspector of Colorado the said inspection certificate of the United States to said cattle—

and that the Colorado statute, approved March 21, 1885, and under which defendant was prosecuted, was repugnant to the provision of the Constitution of the United States giving Congress power to regulate commerce among the States, as well as to the provision declaring that the citizens of each State shall be entitled to all the privileges and immunities of citizens in the several States, and was null and void, as imposing unnecessary and unlawful burdens and restrictions upon interstate commerce.

The court refused to so instruct the jury, but instructed them that if they believed from the evidence, beyond a reasonable doubt, that the defendant did, on or about the 20th day of June, 1901—that is, between the 1st day of April and the 1st day of November of that year—

> Unlawfully bring or drive or cause to be brought or driven into the State of Colorado and into the county of Arapahoe the cattle as mentioned in the information or any part thereof from certain counties south of the thirty-sixth parallel, north latitude, and that said cattle had not been held theretofore at some place north of said parallel of latitude for a period of at least ninety days prior to the importation of said cattle into said State of Colorado, and that the said defendant had not procured from the State veterinary sanitary board of Colorado a certificate or bill of health to the effect that said cattle were free from infectious or contagious diseases, and to the effect that the same had not been exposed at any time within ninety days prior thereto to any of said diseases, and that then and there the said defendant did refuse and decline to procure or permit anyone for him to procure such certificate or bill of health, and did refuse and decline to pay, or allow, or suffer, or permit anyone for him to pay the expense of any inspection so as by the act prescribed, then, and in that event, it is your duty to find the defendant guilty as charged in this information.

The contention here of the defendant is substantially that the subject of the transportation of cattle from one State to another has been so far covered by the act of Congress known as the animal-industry act of May 29, 1884 (23 Stat., 31, chap. 60), that, after its passage, no enactment by the State upon the same subject was permissible, and that even in the absence of legislation by Congress the Colorado statute is invalid in that by its natural or necessary operation it unreasonably obstructs that freedom of commerce among the States which the Constitution established. These questions are recognized by the court as of great importance and have received its most careful consideration.

Taking up the first branch of the defendant's contention, let us look at the controlling provisions of the above act of Congress and ascertain whether that statute has the scope and effect claimed for it.

The statute is entitled "An act for the establishment of a Bureau of Animal Industry, to prevent the exportation of diseased cattle, and to provide means for the suppression and extirpation of pleuro-pneumonia and other contagious diseases among domestic animals."

By the first section the Commissioner of Agriculture is directed to organize in his Department a Bureau of Animal Industry, to appoint a chief thereof, who shall be a competent veterinary surgeon, and whose duty it shall be—

to investigate and report upon the condition of the domestic animals of the United States, their protection and use, and also inquire into and report the causes of contagious, infectious, and communicable diseases among them, and the means for the prevention and cure of the same, and to collect such information on these subjects as shall be valuable to the agricultural and commercial interests of the country. (Sec. 1.)

By the second section the Commissioner is authorized to appoint two competent agents, practical stock raisers or experienced business men familiar with questions pertaining to commercial transactions in live stock, whose duty it shall be, under the instructions of the Commissioner—

To examine and report upon the best methods of treating, transporting, and caring for animals, and the means to be adopted for the suppression and extirpation of contagious pleuro-pneumonia, and to provide against the spread of other dangerous contagious, infectious, and communicable diseases. (Sec. 2.)

The third section makes it—

the duty of the Commissioner of Agriculture to prepare such rules and regulations as he may deem necessary for the speedy and effectual suppression and extirpation of said diseases, and to certify such rules and regulations to the executive authority of each State and Territory, and invite said authorities to cooperate in the execution and enforcement of this act.

And—

Whenever the plans and methods of the Commissioner of Agriculture shall be accepted by any State or Territory in which pleuro-pneumonia or other contagious, infectious, or communicable disease is declared to exist, or such State or Territory shall have adopted plans and methods for the suppression and extirpation of said diseases, and such plans and methods shall be accepted by the Commissioner of Agriculture, and whenever the governor of a State or other properly constituted authorities signify their readiness to cooperate for the extinction of any contagious, infectious, or communicable disease in conformity with the provisions of this act, the Commissioner of Agriculture is hereby authorized to expend so much of the money appropriated by this act as may be necessary in such investigations, and in such disinfection and quarantine measures as may be necessary to prevent the spread of the disease from one State or Territory into another. (Sec. 3.)

In order "to promote the exportation of live stock from the United States" the Commissioner was directed to make special investigation as to the existence of pleuro-pneumonia, or any contagious, infectious, or communicable disease, along the dividing lines between the United States and foreign countries, and along the lines of transportation from all parts of the United States to ports from which live stock are exported, and make report of the results of such investigation to the Secretary of Agriculture, who shall, from time to time, establish such regulations concerning the exportation and transportation of live stock as the results of said investigations may require" (sec. 4), and that "to prevent the exportation from any port of the United States to any port in a foreign country of live stock affected with any contagious, infectious, or communicable disease, and especially pleuro-pneumonia," the Secretary of Agriculture was authorized to take such steps and adopt such measures, not inconsistent with the provisions of the act, as he might deem necessary. (Sec. 5.)

By another section of the act all railroad companies within the United States, or the owners or masters of any steam or sailing vessel or other vessel or boat, were forbidden to receive for transportation or transport from one State or Territory to another, or from any State into the District of Columbia, or from the District into any State—

any live stock affected with any contagious, infectious, or communicable disease, and especially the disease known as pleuro-pneumonia; nor shall any person, company, or corporation deliver for such transportation to any railroad company, or master or owner of any boat or vessel, any live stock, knowing them to be affected with any contagious, infectious, or communicable disease; nor shall any person, company, or corporation drive on foot or transport in private conveyance from one State or Territory to another, or from any State into the District of Columbia, or from the District into any State, any live stock, knowing them to be affected with any contagious, infectious, or communicable disease, and especially the disease known as pleuro-pneumonia: *Provided*, That the so-called splenetic or Texas fever shall not be considered a contagious, infectious, or communicable disease within the meaning of sections four, five, six, and seven of this act, as to cattle being transported by rail to market for slaughter, when the same are unloaded only to be fed and watered in lots on the way thereto. (Sec. 6.)

Other provisions of the act are as follows:

§ 7. That it shall be the duty of the Commissioner of Agriculture to notify, in writing, the proper officials or agents of any railroad, steamboat, or other transportation company doing business in or through any infected locality, and by publication in such newspapers as he may select, of the existence of said contagion; and any person or persons operating any such railroad, or master or owner of any boat or vessel, or owner or custodian of or person having control over such cattle or other live stock within such infected district, who shall knowingly violate the provisions of section six of this act, shall be guilty of a misdemeanor, and, upon conviction, shall be punished by a fine of not less than one hundred nor more than five thousand dollars, or by imprisonment for not more than one year, or by both such fine and imprisonment.

§ 8. That whenever any contagious, infectious, or communicable disease affecting domestic animals, and especially the disease known as pleuro-pneumonia, shall be brought into or shall break out in the District of Columbia, it shall be the duty of the Commissioners of said District to take measures to suppress the same promptly and to prevent the same from spreading, and for this purpose the said Commissioners are hereby empowered to order and require that any premises, farm, or farms where such disease exists or has existed be put in quarantine; to order all or any animals coming into the District to be detained at any place or places for the purpose of inspection and examination; to prescribe regulations for and to require the destruction of animals affected with contagious, infectious, or communicable disease, and for the proper disposition of their hides and carcasses; to prescribe regulations for disinfection, and such other regulations as they may deem necessary to prevent infection or contagion being communicated, and shall report to the Commissioner of Agriculture whatever they may do in pursuance of the provisions of this section.

§ 9. That it shall be the duty of the several United States district attorneys to prosecute all violations of this act which shall be brought to their notice or knowledge by any person making the complaint under oath, and the same shall be heard before any district or circuit court of the United States or Territorial court holden within the district in which the violation of this act has been committed (23 Stat., 31, chap. 60).

It may be here stated that by the act of February 9, 1899, the Department of Agriculture was made one of the Executive Departments of the Government, and placed under the supervision and control of a Secretary of Agriculture (25 Stat., 659, chap. 122); and that by the act of July 14, 1890, the Secretary was vested with all the authority which by the above act of May 29, 1884, was conferred upon the Commissioner of Agriculture (26 Stat., 282, chap. 707).

It is quite true, as urged on behalf of the defendant, that the transportation of live stock from State to State is a branch of the interstate commerce and that any specified rule or regulation in respect of such transportation, which Congress may lawfully prescribe or authorize and which may properly be deemed a regulation of such commerce, is paramount throughout the Union. So that when the entire subject of the transportation of live stock from one State to another is taken under direct national supervision and a system devised by which diseased stock may be excluded from interstate commerce, all local or State regulations in respect of such matters and covering the same ground will cease to have any force, whether formally abrogated or not; and such rules and regulations as Congress may lawfully prescribe or authorize will alone control. (Gibbons *v.* Ogden, 9 Wheat., 1, 210; Morgan *v.* Louisiana, 118 U. S., 455, 464; Hennington *v.* Georgia, 163 U. S., 299, 317; N. Y., N. H. and H. R. R. Co. *v.* New York, 165 U. S., 628, 631; Missouri, Kansas and Texas Railway Company *v.* Haber, 169 U. S., 613, 626; Rasmussen *v.* Idaho, 181 U. S., 198, 200.) The power which the States might thus exercise may in this way be suspended until national control is abandoned and the subject be thereby left under the police power of the States.

But the difficulty with the defendant's case is that Congress has not by any statute covered the whole subject of the transportation of live stock among the several States, and, except in certain particulars not involving the present issue, has left a wide field for the exercise by the States of their power, by appropriate regulations, to protect their domestic animals against contagious, infectious, and communicable diseases.

An examination of the animal-industry act will make this entirely clear. Three distinct subjects are embraced by that act. One is the ascertainment through the Agricultural Department of the condition of the domestic animals of the United States, the causes of contagious, infectious, or communicable diseases affecting them, the best methods for treating, transporting, and caring for animals, the means to be adopted for the suppression and extirpation of such diseases, particularly that of contagious pleuro-pneumonia, and to collect such information on those subjects as will be valuable to the agricultural and commercial interests of the country. Congress did not assume to declare that "the rules and regulations" which that Department might adopt as necessary "for the speedy and effectual suppression and extirpation of said diseases" should have in themselves, or apart from the action of a State, any binding force upon the States. They were to be certified to the executive authority of each State, and the cooperation of such authorities in executing the act of Congress invited. If the authorities of any State adopted the plans and methods devised by the Department, or if the State authorities adopted measures of their own which the Department approved, then the money appropriated by Congress could be used in conducting the required investigations and in such disinfection and quarantine measures as might be necessary to prevent the spread of the diseases in question from one State or Territory into another. Congress did not intend to override the power of the States to care for the safety of the property of their peoples by such legislation as they deemed appropriate. It did not undertake to invest any officer or agent of the Department with authority to go into a State and without its assent take charge of the work of suppressing or extirpating contagious, infectious, or communicable diseases there prevailing and which endangered the health of domestic animals. Nor did Congress give the Department authority by its officers or agents to inspect cattle within the limits of a State and give a certificate that should be of superior authority in that or other States, or which should entitle the owner to carry his cattle into or through another State without reference to the reasonable and valid regulations which the latter State may have adopted for the protection of its own domestic animals. It should never be held that Congress intends to supersede or by its legislation suspend the exercise of the police powers of the States, even when it may do so, unless its purpose to effect that result is clearly manifested. This court has said—and the principle has been often reaffirmed—that "in the application of the principle of the supremacy of an act of Congress in a case where the State law is but the exercise of a reserved power, the repugnance or conflict should be direct and positive, so that the two acts could not be reconciled or consistently stand together." (Sinnott *v.* Davenport, 22 How., 227, 243.) The certificate given to the defendant by Assistant Inspector Hart, of the Bureau of Animal Industry, was in itself without legal weight in Colorado. As said in Missouri, Kansas and Texas Railway Company *v.* Haber, above cited:

> While the States were invited to cooperate with the General Government in the execution and enforcement of the act, whatever power they had to protect their domestic cattle against such diseases was left untouched and unimpaired by the act of Congress.

Hence, it was decided in that case that the animal-industry act did not stand in the way of the State of Kansas enacting a statute declaring that any person driving, shipping, or transporting, or causing to be shipped, driven, or transported, into or through that State any cattle liable or capable of communicating Texas or splenetic fever to domestic cattle should be liable to the person injured thereby for all damages sustained by reason of the communication of said disease or fever, to be recovered in a civil action. We there held that the Kansas statute did nothing more than establish a rule of civil liability in that State, affected no regulation of interstate commerce that Congress had prescribed or authorized, and impaired no right secured by the National Constitution.

Another subject embraced by the act of Congress related to the exportation from ports of the United States to ports in foreign countries of live stock affected with contagious, infectious, or communicable diseases, especially pleuro-pneumonia; and in relation to that matter the Secretary of the Treasury was authorized to take such steps and adopt such measures, not inconsistent with the act of Congress, as he deemed necessary. As the present case is not one of the exportation of live stock to a foreign country, it is unnecessary to consider what power, if any, remained with the States after the passage of the animal-industry act to suppress or extirpate diseases that in fact affected live stock which it was the purpose of the owners to export.

Still another subject covered by the act is the driving on foot or transporting from one State or Territory into another State or Territory, or from any State into the District of Columbia, or from the District into any State, of any live stock known to be affected with any contagious, infectious or communicable disease. But this provision does not cover the entire subject of the transporting or shipping of diseased live stock from one State to another. The owner of such stock, when bringing them into another State, may not know them to be diseased; but they may, in fact, be diseased, or the circumstances may be such as fairly to authorize the

State into which they are about to be brought to take such precautionary measures as will reasonably guard its own domestic animals against danger from contagious, infectious, or communicable diseases.

The act of Congress left the State free to cover that field by such regulations as it deemed appropriate, and which only incidentally affected the freedom of interstate commerce. Congress went no further than to make it an offense against the United States for anyone knowingly to take or send from one State or Territory to another State or Territory, or into the District of Columbia, or from the District into any State, live stock affected with infectious or communicable disease. The animal-industry act did not make it an offense against the United States to send from one State into another live stock which the shipper did not know were diseased. The offense charged upon the defendant in the State court was not the introduction into Colorado of cattle that he knew to be diseased. He was charged with having brought his cattle into Colorado from certain counties in Texas south of the thirty-sixth parallel of north latitude without said cattle having been held at some place north of said parallel of latitude for at least the time required prior to their being brought into Colorado, and without having procured from the State veterinary sanitary board a certificate or bill of health to the effect that his cattle—in fact—were free from all infectious or contagious diseases, and had not been exposed at any time within ninety days prior thereto to any such diseases, but had declined to procure such certificate or have the inspection required by the statute. His knowledge as to the actual condition of the cattle was of no consequence under the State enactment or under the charge made.

Our conclusion is that the statute of Colorado as here involved does not cover the same ground as the act of Congress, and therefore is not inconsistent with that act; and its constitutionality is not to be questioned unless it be in violation of the Constitution of the United States, independently of any legislation by Congress. The latter question we now proceed to examine.

Certain principles are well settled by the former decisions of this court. One is that the purpose of a statute, in whatever language it may be framed, must be determined by its natural and reasonable effect. (Henderson *v.* Mayor, etc., 92 U. S., 259, 268.) Another is that a State may not, by its police regulations, whatever their object, unnecessarily burden foreign or interstate commerce. (Railroad Company *v.* Husen, 95 U. S., 465, 472.) Again, the acknowledged police powers of a State can not legitimately be exerted so as to defeat or impair a right secured by the National Constitution any more than to defeat or impair a statute passed by Congress in pursuance of the powers granted to it. (Gibbons *v.* Ogden, 9 Wheat., 1, 210; Missouri, Kansas and Texas Railway Company *v.* Haber, 169 U. S., 613, 625, 626, and authorities cited.)

Now, it is said that the defendant has a right under the Constitution of the United States to ship live stock from one State to another State. This will be conceded on all hands. But the defendant is not given by that instrument the right to introduce into a State, against its will, live stock affected by a contagious, infectious, or communicable disease, and whose presence in the State will or may be injurious to its domestic animals. The State—Congress not having assumed charge of the matter as involved in interstate commerce—may protect its people and their property against such dangers, taking care always that the means employed to that end do not go beyond the necessities of the case or unreasonably burden the exercise of privileges secured by the Constitution of the United States.

Is the statute of Colorado liable to the objection just stated? Can the courts hold that upon its face it unreasonably obstructs the exercise of the general right secured by the Constitution to ship or send recognized articles of commerce from one State to another without interference by local authority? Those questions must be answered in the negative. The Colorado statute, in effect, declares that live stock coming, between the dates and from the territory specified, are, ordinarily, in such condition that their presence in the State may be dangerous to its domestic animals; and hence the requirement that before being brought or sent into the State they shall either be kept at some place north of the thirty-sixth parallel of north latitude for at least ninety days prior to their importation into the State, or the owner must procure from the State veterinary sanitary board a certificate or bill of health that the cattle are free from all infectious or contagious diseases, and have not been exposed to any of said diseases at any time within ninety days prior thereto. As there is no evidence in the case as to the practical operation of this regulation upon shippers of cattle, as it does not appear otherwise than that the statute can be obeyed without serious embarrassment or unreasonable cost, the court can not assume arbitrarily that the State acted wholly without authority or that it unduly burdened the exercise of the privilege of engaging in interstate commerce. The accused seems to have been content to rest his defense upon such grounds as arose upon the face of the local statute, without reference to any evidence bearing upon the reasonableness or unreasonableness of the particular methods adopted by the State to protect its domestic animals. He seems to have been willing to risk the case upon the simple proposition—based upon the words of the State enactment and upon the act of Congress, reenforced by certain regulations made by the Agricultural Department—that the local statute was inconsistent with that act and with the general power of Congress to regulate interstate commerce.

As, therefore, the statute does not forbid the introduction into the State of all live stock coming from the defined territory—that diseased as well as that not diseased—but only prescribes certain methods to protect the domestic animals of Colorado from contact with live stock coming from that territory between certain dates, and as those methods have been devised by the State under the power to protect the property of its people from injury, and do not appear upon their face to be unreasonable, we must, in the absence of evidence showing the contrary, assume that they are appropriate to the object which the State is entitled to accomplish.

One other objection to the Colorado statute must be noticed, namely, that it is inconsistent with the clause of the Constitution declaring that the citizens of each State shall be entitled to all privileges and immunities of citizens in the several States. This position is untenable. The statute is equally applicable to citizens of all the States. No discrimination is shown. No privileges are granted to citizens of Colorado that are denied to citizens of other States. (Kimmish *v.* Ball, 129 U. S., 217, 222.)

The principle is universal that legislation, whether by Congress or by a State, must be taken to be valid unless the contrary is made clearly to appear; and as the contrary does not so appear, the statute of Colorado is to be taken as a constitutional exercise of the power of the State.

Perceiving no error in the judgment to the prejudice of the plaintiff under the Constitution of the United States, the judgment is affirmed.

Mr. Justice Brewer dissented from the opinion and judgment of the court.

True copy.

Test: ——— ———.

Clerk Supreme Court of the United States.

Mr. Springer. The persons interested in the shipment of live stock were very much disappointed in this opinion, but, after reading carefully, I must say that I think the Supreme Court has decided the law as it is. In the argument of this case and its trial we stood upon the regulations of the Department of Agriculture, and never for a moment assumed our right, or anybody's right, to go behind them to the law to see whether the Secretary was authorized to make these regulations. We stood upon the regulations, and that was the position of both parties in the courts; but the Supreme Court went behind all of us, and found in the law itself a weak place. They found that it did not authorize the Secretary to do these things, so far as it amounted to a regulation of interstate commerce.

All we ask, and what all the shippers of this country are very much concerned in securing, is a legislative provision, coming from Congress at this session—and the earlier the better, because it is all in confusion now—which will give the authority to the Secretary of Agriculture which it was assumed he had before, and which he has been exercising during the past ten or twelve years.

I will read a provision which I have formulated and which meets the views of the Department of Agriculture. This can be inserted in any act you pass.

> Sec. —. That in order to enable the Secretary of Agriculture to effectually suppress and extirpate contagious pleuro-pneumonia, foot and mouth diseases, and other dangerous, contagious, infectious, and communicable diseases in cattle and other live stock, and to prevent the spread of such diseases, the powers conferred upon the Secretary of the Treasury by sections 4 and 5 of an act entitled "An act for the establishment of a Bureau of Animal Industry, to prevent the exportation of diseased cattle, and to provide means for the suppression and extirpation of pleuro-pneumonia and other contagious diseases among domestic animals," approved May 29, 1884 (23 Stat. L., 31), are hereby conferred on the Secretary of Agriculture. He is hereby authorized and directed, from time to time, to establish such rules and regulations concerning the exportation and transportation of live stock from any place within the United States where he may have reason to believe such diseases may exist into and through any State or Territory, including the Indian Territory, and into and through the District of Columbia and to foreign countries, as he may deem necessary; and all such rules and regulations shall have the force of law.
>
> Whenever any inspector or assistant inspector of the Bureau of Animal Industry shall issue a certificate showing that such officer had inspected any cattle or other live stock which were about to be shipped, driven, or transported from such locality to another as above described, and had found them free from Texas or splenetic fever infection (Boophilus bovis), pleuro-pneumonia, foot or mouth disease, or any other infectious, contagious, or communicable disease, such animals so inspected and certified may be shipped, driven, or transported from such place to and through any State or Territory, including the Indian Territory, and into and through the District of Columbia, or may remain therein, or they may be exported from the United States without further inspection or the exaction of fees of any kind.

Let me call your attention to the first clause here. It is that powers conferred upon the Secretary of the Treasury under sections 4 and 5 of the Bureau of Animal Industry act shall now be conferred upon the Secretary of Agriculture. The reason of that is this——

The CHAIRMAN. Right there, Judge Springer, would the order of the Secretary of the Treasury cover the Reid cattle in Colorado?

Mr. SPRINGER. He could have issued regulations which would have covered it, in my judgment.

The CHAIRMAN. And which the State of Colorado would have had to observe, so the cattle could have gone into Colorado free from examination.

Mr. SPRINGER. It could have been done if those powers had been conferred on the Secretary of Agriculture.

The CHAIRMAN. But not on the Secretary of the Treasury. So that the purpose of this act is now to transfer to the Secretary of Agriculture the power conferred on the Secretary of the Treasury by that act.

Mr. SPRINGER. And to make it more effective.

Representative ALLEN. The transfer would make it concurrent, as I understand.

Mr. SPRINGER. The point is this: When Congress passed the act establishing the Bureau of Animal Industry, the Department of Agriculture was simply a bureau.

The CHAIRMAN. That is right.

Mr. SPRINGER. And the head of the bureau could not issue any of these orders which would have amounted to regulations.

Representative WILLIAMS. Was that bureau in the Treasury Department at that time?

Mr. SPRINGER. I will ask Secretary Wilson about that.

Secretary WILSON. What was that?

Mr. SPRINGER. Before your Department was made a department, was it in the Treasury Department?

Secretary WILSON. Oh, no.

Representative ALLEN. Was the Bureau of Animal Industry under the Treasury Department?

Secretary WILSON. Never.

The CHAIRMAN. It is curious, then, that power should have been given to the Secretary of the Treasury to issue these orders.

Mr. SPRINGER. All the powers of that act were conferred upon the Commissioner of Agriculture except in two places, where it was necessary to issue these national regulations. There it was put in the Secretary of the Treasury, because he was a Cabinet officer; and when the Bureau was made a department and the Commissioner was made a Secretary, the law provided that all the powers that had been conferred upon the Commissioner of Agriculture should be conferred upon the Secretary of Agriculture.

The CHAIRMAN. But this power was not.

Mr. SPRINGER. But it neglected to cover these two propositions, although they stayed in the Treasury Department as a mere naked machine, without any efficiency or power whatever, or any force behind the Secretary of the Treasury or with him, in order to enable him to carry out this act. He was stripped of all that power, because the power to execute was given to the Commissioner of Agriculture; but the power to issue these regulations was left with the Secretary of the Treasury. It was an oversight.

This proposed provision does not deprive the Secretary of the Treasury of any power that Congress intended he should now exercise, because it was intended by the Bureau of Animal Industry act to give all these powers into the Department of Agriculture. The only object of this first clause here is to carry out the intention of Congress when it established the Department of Agriculture as a department of the Government and gave it all the powers over this question of dealing with infectious diseases of cattle.

This proposition, therefore, has been prepared, and I think I have done it very carefully, as I have tried to, for the purpose of meeting the objections which were disclosed by the recent decision of the Supreme Court, and for the purpose of conferring upon the Department of Agriculture those powers which it was supposed Congress had already conferred upon this department, and which are now especially important in view of the breaking out of foot-and-mouth disease in the New England States.

The CHAIRMAN. Has this question ever arisen before?

Mr. SPRINGER. No; this is the first time the Supreme Court ever passed upon it.

The CHAIRMAN. Is it the first time a State has refused to practically honor the permit of the Secretary of Agriculture? Has it ever been refused before?

Mr. SPRINGER. I think it has not.

The CHAIRMAN. A test case was made of it.

Mr. SPRINGER. I think the orders of the Secretary have been heretofore universally observed.

Secretary WILSON. Yes: this is the first case we have had.

Mr. SPRINGER. It is the first case where there has been a conflict.

The CHAIRMAN. You have issued these permits, have you?

Secretary WILSON. All the time.

The CHAIRMAN. And they have always been honored until this? This has brought the thing to a focus?

Mr. SPRINGER. The Supreme Court holds that Congress has power to do this, but has not done it.

In view of the present conditions in New England, if the owner of a valuable herd of breeding cattle now in New England should desire to ship them beyond the reach of these contagious diseases, which may seize his herd at any time and destroy it. he could not get them outside of the State where it is, under these conditions, unless he was subjected to inspections by the States wherever he might cross in going to any place; but if this law is passed the Bureau of Animal Industry can have the inspection made and, finding a herd free, can let it go out to places where it can be kept until the danger of contagion has passed away. So that one means of suppressing an infectious disease is to isolate it. and you can only isolate it when you can take the diseased cattle away from those that are not diseased, and those that are not diseased away from those that are diseased.

This provision of the law will enable you to do it at once in New England, so that the cattle that are not affected now and are free from this contagion and that are domiciled there can be moved out into the neighboring State after inspection by the Department and after a certificate is issued as provided in this proposition.

I think it is to the interest of everybody that this should be done at once and as a part of this emergency bill. If it is not done, the shippers are subjected to this condition: Coming, under the old condition, from Texas to the seaboard with a train of cattle, you would have to pass through eight or nine States. The States have now discovered that under this decision there is no power in the Department of Agriculture to give a certificate that would carry these cattle through to the seaboard.

The CHAIRMAN. Pennsylvania is just quarantined against New York?

Mr. SPRINGER. That is it. You are coming right to it, and you will find the States will all be raising their quarantine and inspection laws, and interstate commerce in cattle will be virtually suppressed and prohibited. It will be impossible to carry it on. You can not get a train of cars from Texas to New York in two weeks and at an expense that would not absolutely make the business unprofitable if they had to submit to an inspection at every State line they passed through. The delay and expense would be so great as to suppress the interstate commerce in live stock.

Representative COONEY. With reference to this power you propose to give the Secretary of Agriculture with reference to the present conditions in New England and the certificate he gives, will that also designate to where the cattle can be taken?

Mr. SPRINGER. He can do that. It is in his discretion.

Representative COONEY. So that the person who holds the certificate not only has the power to move them, but is likewise compelled to move them out of the region that is infected.

Mr. SPRINGER. That may be infected. He can get out of the reach of the infection.

Representative COONEY. He would have the power to do that.

Mr. SPRINGER. He would have the power to do that under a certificate. This power, gentlemen, is not a new power. It is the one the Department has been exercising for years; how many years, Mr. Wilson?

Secretary WILSON. Some twelve or fourteen years.

Mr. SPRINGER. For twelve or fourteen years the Department of Agriculture has been exercising just this power, and it has never been discovered until the recent decision of the Supreme Court that that power was not conferred by Congress upon this Department.

The CHAIRMAN. It was vested in the Secretary of the Treasury.

Mr. SPRINGER. Whatever power there was was vested in the Secretary of the Treasury, so far as these rules are concerned.

Representative GRAFF. What does the Supreme Court hold there in this case you have cited, or in any other case, about the respective powers of the State and General Government with reference to these inspections or quarantine laws?

Mr. SPRINGER. The court holds this, substantially. I can not give the language, but I can give the substance—that the States may establish reasonable inspection laws to prevent diseased animals from coming into their State; but whenever Congress has exercised the power of making the inspections and regulations of interstate commerce in such cattle, the State laws must give way to those passed by Congress;

that Congress has the power to regulate commerce among the States and with foreign nations, and whenever Congress makes these regulations to the extent of an interstate regulation, those regulations are paramount and must prevail everywhere.

Representative GRAFF. But in this case, as I understand it, there had already been legislation conferring this power on the Secretary of the Treasury. Did the court hold that that law was not effective, or was it because it was not enforced?

Mr. SPRINGER. There was no pretense in this case that the Secretary of the Treasury had ever issued any regulations at all.

Representative GRAFF. It was because he had not enforced them.

Mr. SPRINGER. He had not done anything. He had no power to do anything, because he had no agents or instruments for doing anything. He had never been called upon to do anything. He had a naked power, which the Secretary of Agriculture was exercising with the forces Congress had given him. If you will look this thing over carefully, as I have done, you will reach the conclusion that this proposition which is here submitted is simply to carry out the very power which it was supposed heretofore by all concerned Congress had conferred upon the Department of Agriculture.

The CHAIRMAN. It was simply an oversight.

Mr. SPRINGER. An oversight—a casus omissus, as the lawyers say—and when the Supreme Court went behind the regulations of the Secretary of Agriculture and put a very fine judicial sight upon the construction of the law under which he was acting it said that this is only a power to suppress and extirpate, and did not authorize the Commissioner of Agriculture to issue regulations which would amount to regulations of interstate commerce. Hence, Congress not having acted in this respect, the laws of the States may have effect, and hence the laws of the State of Colorado were properly enacted.

Representative WILLIAMS. That proceeds upon the general lines that the police power will be exercised where Congress does not act.

Secretary WILSON. There is one point you might make there, Judge. That is the fact that the officers want fees in the several States will cause trouble. If they can get fees on 800 head of cattle passing through their State, they can get a good deal of money.

Mr. SPRINGER. That is true. I believe there is nothing further, Mr. Chairman, that I desire to say.

Representative ALLEN. I want to call your attention, Mr. Springer, to the latter part of this bill that you propose, and ask to have your opinion as to whether or not it might not operate very dangerously. It says: "Such animals, so inspected and certified, may be shipped, driven, or transported from such place into and through any State or Territory, including the Indian Territory, and into and through the District of Columbia, or may remain therein, or they may be exported from the United States without further inspection or the exaction of fees of any kind." If a contagion should strike these cattle after they get into a State and they should become diseased, would not that preclude the idea of another inspection, and might not the fact that even though they might become contagious they could still be allowed, under this original order of the Secretary of Agriculture, to be shipped into another State where they had not contracted that disease?

Mr. SPRINGER. The idea was that these cattle would be in transitu; that these certificates were only to be given to cattle that were moving, and it was to carry them to their destination. If there should be a reasonable delay, I think the condition would have passed which authorized this, and the new conditions having arisen a new inspection would be in order.

The CHAIRMAN. But I think there is a good deal of force in what Mr. Allen says.

Representative ALLEN. Suppose I am shipping a herd of cattle from Kentucky and they have been duly inspected before they leave the State, and while they are on the way through Indiana a disease develops among them. Under a strict construction of this law I can not be prevented from shipping those cattle right on through Indiana, Ohio, Illinois, or any other State.

Secretary WILSON. We would stop that.

Representative ALLEN. But the law does not provide for it.

Mr. SPRINGER. It would be the duty of the shipper to inform the Secretary of Agriculture, and he should have a new inspection.

The CHAIRMAN. There is the danger of the thing. Men among whose herds diseases break out very seldom divulge it. They are hoping for something to happen which will enable them to sell the herd and get rid of them.

Secretary WILSON. Let me say a word there, Mr. Allen, with regard to Southern cattle. We are using this authority all the time. They have the tick south of a certain line, and all the time gentlemen come to us and say, "Here is a part of the county where there never have been any ticks; here are animals that we want to ship North."

We send inspectors to see whether that is so, and if the cattle are entirely free from ticks we can let them go on to market. It is used for the benefit of the South all the time to enable them to go North. That is where we get those requests for permits, perpetually, all the time. We may have counties out and in, as we find they are free from ticks, or otherwise.

Representative ALLEN. Mr. Secretary, if you will permit me, I believe, under the law, cattle are required to be unloaded at stated intervals.

Secretary WILSON. Yes.

Representative ALLEN. Suppose it should develop on one of those occasions, before those cattle had reached their destination, that some of them are diseased. I hold that under that law, unqualified as it is, a shipper would have a right to transport those cattle along to their destination, whether specified or not by the Secretary of Agriculture, notwithstanding the fact of that contagion; and it seems to me there ought to be a provision there that would require those cattle to be stopped immediately on the filing of an affidavit, making oath to the facts existing, and another inspection required.

Secretary WILSON. It would be their duty at once to notify us.

Representative ALLEN. But there is nothing in the law to require the shipper to do that, and nothing to require the railroad or the common carrier to hold that property.

The CHAIRMAN. You might put in the law that they should be transported under such rules and regulations as the Secretary of Agriculture might prescribe, and then he may give a free permit for a drove of cattle to be shipped, for instance, to Kansas City, at which place his order will show they must be reexamined by his agent, and at

Kansas City that agent will say this bunch of cattle can be shipped to Chicago, at which place they must be examined again.

Representative ALLEN. I hold that whenever it is apparent that this disease has developed it is imperative that those cattle should be stopped immediately, right there.

Secretary WILSON. Make it our duty in the law.

Mr. SPRINGER. I will suggest, in view of Mr. Allen's proposition, that you might add this provision to the end of this section:

> *Provided*, That if any such disease should break out in cattle in transit they may be subjected to another inspection by the Bureau of Animal Industry upon any complaint being made.

Representative WILLIAMS. The Department may discover it itself.

Representative ALLEN. That is true.

Mr. SPRINGER. They would not do it unless it was brought to their attention. Perhaps it should read: "Shall be subject to another inspection by the Board of Animal Industry."

Representative ALLEN. And shall be held until such inspection has been made.

The CHAIRMAN. That will not cover that point, Mr. Allen, in which I think there is a good deal of force.

Representative GRAFF. Make it read: "And shall be held upon complaint or otherwise."

The CHAIRMAN. The point Mr. Allen makes is that after they reach their destination they are practically free from supervision and might be sold and scattered over the country before anybody knew there was disease among them, under the strict interpretation of that law.

Mr. SPRINGER. Here is what the Department can do now, and what it is proposed to make definite:

> He is hereby authorized and directed from time to time to make such rules and regulations concerning the exportation and transportation of live stock from any place within the United States where he may have reason to believe such diseases may exist, into and through any State or Territory, including the Indian Territory, and into and through the District of Columbia, and to foreign countries, as he may deem necessary.

So that the authority given here would enable the Secretary, in his regulations, to provide for all of these questions that might arise in reference to the breaking out of disease after they had once been inspected.

Representative ALLEN. It goes on and says:

> Such animals so inspected and certified may be shipped, driven, or transported from such place into and through any State or Territory, including the Indian Territory, and into and through the District of Columbia, or may remain therein, or they may be exported from the United States without further inspection or the exaction of fees of any kind.

Representative SCOTT. Why not have it read: "Without further inspection, except such as may be ordered by the Secretary of Agriculture?"

Representative WILLIAMS. Right along there provision ought to be made very carefully.

Representative ALLEN. You ought to provide for the further inspection. This disease does exist, and disposition ought to be made of those cattle at once in the nature of a quarantine right there, at the expense of the owner.

Representative SCOTT. The idea that occurred to me was that by inserting those words, "except such as may be ordered by the Secretary of Agriculture," it would keep the cattle all the time under the supervision of the Secretary.

The CHAIRMAN. That is my point.

Representative SCOTT. It would not give them a clean bill of health to their destination and put them out of his own control. This law says they shall not be subject to any inspection, which would imply, of course, that they should not be subject even to governmental inspection after this certificate had been once issued.

Secretary WILSON. The main difficulty in this matter, gentlemen, pertains to getting cattle from the Southern States south of the quarantine line, where they have ticks; and you can guard that as carefully as you think wise, but unless you give us authority to let the Southern States send their cattle North when we are satisfied they are healthy, under the present Supreme Court ruling they will never get North.

Representative SCOTT. Mr. Secretary, I had in mind this suggestion: That some cattle owner in the New England States might wish, now, to get his herd out of danger, and he would get a clean bill of health from your Department, but by the time he got his cattle to Chicago it might prove that disease had developed.

Secretary WILSON. Let me assure you he will not get anything until we are entirely through.

Representative SCOTT. He might easily claim it under this section.

Secretary WILSON. He will not get it.

Representative HAUGEN. Mr. Allen, have you examined the provision there? Does this not give the Secretary authority to order more than one inspection, subject to the rules and regulations of the Department?

Representative ALLEN. I think not. After they have been once inspected, they shall not be subject to further inspection.

Representative WILLIAMS. As I understand, it gives the owner of the cattle a vested right after this first inspection.

Representative ALLEN. Yes; it is a conclusive certificate.

Representative WILLIAMS. I agree with Mr. Allen. It ought to be carefully guarded.

Secretary WILSON. Do not leave it that way. Leave it so that we can examine them as often as we please.

Mr. SPRINGER. I suggest that you add this proviso:

> That if said diseases, or any of them, break out in such cattle in transitu, they may be subjected to another inspection by the Bureau of Animal Industry, and they shall be held for such inspection for such time as may be necessary, and such order shall be made therefor as may be deemed necessary.

The CHAIRMAN. That does not quite cover it, because that disease might break out in transitu, and the owner, having this clean bill of health, could land them where the cattle are billed to and sell them without saying a word to anybody, and they might escape inspection of the Bureau officers at the point of destination.

Representative ALLEN. How are you going to find it out?

The CHAIRMAN. In cases of emergency like this foot-and-mouth disease he should have the power to ship them in the care of, perhaps, a Bureau officer at the next point, where they shall be examined again, and they are in charge therefore of the Bureau during the whole inspection. How would something of that sort do, Mr. Secretary?

Secretary WILSON. We have been operating under authority that we supposed we possessed, and I do not remember a single case——

The CHAIRMAN. If he could provide in his rules and regulations that these cattle should be shipped in transitu, say, from John Smith, at Kansas City, to Richard Doe, care of the United States inspection officers, then they will be continually in the charge of that Bureau, and when they arrive at their destination they can be again inspected before they are put on the markets or distributed in any way.

Mr. SPRINGER. It is in your power to make those regulations, Mr. Secretary, if this is passed.

Secretary WILSON. I think so.

The CHAIRMAN. My point is that they should not be released from the supervision of the Bureau of Animal Industry for one moment.

Representative SCOTT. Mr. Chairman, I would like to ask again if this would not meet the point you are suggesting? I will read the last clause of the bill as it appears here:

> Or may remain therein, or they may be exported from the United States, without further inspection or the exaction of fees of any kind.

I propose to add:

> Except such inspection as may at any time be ordered by the Secretary of Agriculture.

Representative WILLIAMS. You include inspection, but you leave our fees.

Representative SCOTT. Well, "except such as may be ordered by the Secretary of Agriculture."

Representative WILLIAMS. "Or may be provided under the general regulations of the Department."

Mr. SPINGER. I think that covers it.

The CHAIRMAN. I think that covers my point. It reads:

> He is hereby authorized and directed from time to time to establish such rules and regulations concerning the exportation and transportation of live stock.

Now, in his rules and regulations he can insist that this stock e shipped from point to point, if it is going through several States, in the care of bureau officers. I think you can do that, Mr. Secretary.

Secretary WILSON. We do that now. We have our inspectors at every town.

The CHAIRMAN. Are they shipped in the care of the inspector?

Secretary WILSON. No; they are shipped in his care, but they are subject always to his supervision.

The CHAIRMAN. It is covered anyway, I think, by the rules and regulations.

Secretary WILSON. I think so.

Representative SCOTT. Mr. Chairman, it occurs to me that such an addition as I have suggested ought to be made here on account of the unqualified nature of the last clause of this section, where it declares that these cattle may be transported to all these places without further inspection or the exaction of fees of any kind. It seems to me that a man who held that kind of a certificate could easily say, even to an official of the Department of Agriculture who might attempt to intercept him: "Here is my bill of health. You have no right to inspect me; I have been inspected."

Representative HAUGEN. Suppose the bill of health was subject to an examination?

The CHAIRMAN. One moment. How do you propose to remedy that?

Representative SCOTT. If his certificate of inspection included the assertion that he should be exempt from further inspection except such as may at any time be ordered by the Secretary, then the new official who comes to him might say: "Here, I have an order from the Secretary dated subsequent to your certificate authorizing and requiring me to make this inspection." The idea I have is this: In the case which the Secretary has alluded to of shipping cattle north from the southern latitudes, it seems reasonably clear under the experience of the shippers and the Department that if cattle start free from ticks the disease will not develop in transitu or at their destination; but it might easily happen that cattle might start from New England with this foot and mouth disease and it could not be detected by inspection there, but it could develop before they reached their destination.

Now, upon complaint of any person or upon information to the effect that the herd seemed to be infected, the Secretary could order an inspection at any point where those cattle happen to be, whether in transitu or at their destination, and it seems to me that with the addition of the phrase I have suggested there, the law would amply authorize him to do that.

Secretary WILSON. I would suggest one or two points there. The object of Judge Springer in drafting that bill is to get out from the onus of this Supreme Court decision with regard to State inspection.

Representative SCOTT. Certainly.

Secretary WILSON. I would suggest that you put in two or three words right there—"they shall be free from State inspection."

Representative SCOTT. I thought about that, but I did not think that was wise.

Representative WILLIAMS. Here is a situation that might confront you here to-day. They ship a herd of these cattle from New England. You inspect them up there. You can find no visible symptoms of disease. They pass down into Pennsylvania or Maryland, or some State near there, and the State inspector wants to look at them for the protection of the people of the State. He finds that in his opinion they are infected with disease. There are several sides to this question. Our sole object is not to get from under the decision of the Supreme Court. We want to leave the States such rights as they ought to have left. The cattle ought to be subject to inspection later by the Department, and in order to protect the State it ought to be made not only the privilege of the Department to inspect them under the law—they ought not only to have the power—but it ought to be made the duty of the Department to do it. Then the State can very well lie on its oars; but you must not take that power to protect themselves away from the States, without making it mandatory upon somebody else to exercise it.

Secretary WILSON. Yes; but you must get something to stop the State officials from exacting fees from your cattle as they come north. With regard to this New England business, there is no danger on that point, because I will not allow them to do anything of that kind.

Representative WILLIAMS. Mr. Secretary, if you will listen a moment, I think Mr. Scott has it very nearly right.

Representative GRAFF. So do I.

Representative WILLIAMS. We have heard the other language—

> Except such as may at any time be ordered or exacted by the Secretary of Agriculture or as may be provided under the regulations of the Department of Agriculture.

Now, the latter part of this clause would control your Southern tick question and all ordinary questions that are concerned in their presentation. The first part of it gives you the opportunity to make special orders to fit emergencies, in addition to your prescribed regulations in the Department. It seems to me this pretty well suits both conditions.

Representative GRAFF. That rebuts the idea that would prevail, necessarily, that he could not issue any other order.

The CHAIRMAN. Mr. Scott, read to the committee your language, so that the committee may thoroughly understand it. Start at the beginning.

Mr. SCOTT (reading):

> He is hereby authorized and directed, from time to time, to establish such rules and regulations concerning the exportation and transportation of live stock from any place within the United States where he may have reason to believe such diseases may exist, into and through any State or Territory, including the Indian Territory, and into and through the District of Columbia, and to foreign countries, as he may deem necessary; and all such rules and regulations will have the force of law.
>
> Whenever any inspector or assistant inspector of the Bureau of Animal Industry shall issue a certificate showing that such officer had inspected any cattle or other live stock which were about to be shipped, driven, or transported from such locality to another, as above stated, and had found them free from Texas or splenetic fever infection, pleuro-pneumonia, foot-and-mouth disease, or any other infectious, contagious, or communicable disease, such animals so inspected and certified may be shipped, driven, or transported from such place to and through any State or Territory, including the Indian Territory, and into and through the District of Columbia, or may remain therein, or they may be exported from the United States without further inspection or the exaction of fees of any kind, except such as may at any time be ordered or exacted by the Secretary of Agriculture, or as may be provided under the regulations of the Department of Agriculture.

Secretary WILSON. That is all right.

The CHAIRMAN. Mr. Secretary, why mention all those diseases? Why not say "any infectious disease?"

Secretary WILSON. It would be just as well, I suppose. It would not do any harm.

Mr. SPRINGER. They are all mentioned in the Bureau of Animal Industry act. That is where they came from.

The CHAIRMAN. This would have to be passed as a separate act.

Secretary WILSON. No; it is perfectly germane upon this subject.

The CHAIRMAN. We would not offer it as an amendment to the Bureau of Animal Industry act. The committee will discuss it later; but I think probably the best way to pass this would be to pass it by itself, with the appropriation added to it, and do the whole thing at once.

Representative ALLEN. Mr. Chairman, I want to add this to what has been read there. I wish to call the attention of the Secretary to this:

> All such shipments of such animals shall be at all times under the control and supervision of the Bureau of Animal Industry for the purposes of such inspection.

The CHAIRMAN. You suggest that, do you, in lieu of what Mr. Scott suggests?

Representative ALLEN. To be added to it. It puts it under the control of the Bureau of Animal Industry. They can stop the cattle and hold them for that purpose and exercise that power.

Secretary WILSON. That will not do any harm.

Representative ALLEN. I believe it will help.

> All such shipments of such animals shall be at all times under the control and supervision of the Bureau of Animal Industry for the purposes of such inspection.

What do you think of that, Mr. Scott, as an addition?

Representative SCOTT. I think that is all right. I was simply suggesting to the Chairman that we can perhaps perfect this bill later.

Mr. SPRINGER. Mr. Chairman, I concur fully in this proposition as proposed to be amended. With the permission of the committee I will read sections 4 and 5 of the Bureau of Animal Industry act. I think it would be well for the committee to have these sections in mind.

> SEC. 4. That in order to promote the exportation of live stock from the United States, the Commissioner of Agriculture shall make special investigation as to the existence of pleuro-pneumonia, or any contagious, infectious, or communicable disease along the dividing lines between the United States and foreign countries, and along the lines of transportation from all parts of the United States to ports from which live stock are exported, and to make report of the results of such investigation to the Secretary of the Treasury, who shall, from time to time, establish such regulations concerning the exportation and transportation of live stock as the results of such investigation may require.
>
> SEC. 5. That to prevent the exportation from any port of the United States to any port in a foreign country of live stock affected with any contagious, infectious, or communicable disease, and especially pleuro-pneumonia, the Secretary of the Treasury shall, and he is hereby, authorized to take such steps and take such measures not inconsistent with the provisions of this act as may be deemed necessary.

The words "Secretary of the Treasury" are stricken out by this proposed proposition and the "Secretary of Agriculture" inserted. If that had been done before, the Secretary of Agriculture would have had power, in my opinion, to issue the certificate which he did issue in the case I have referred to.

Representative WILLIAMS. That is not interstate, but foreign com merce.

Mr. SPRINGER. It says here—

> who shall, from time to time, establish such regulations concerning the exportation and transportation of live stock as the results of such investigations may require.

That means transportation all along the line, through the States, to foreign countries.

Representative WILLIAMS. That is for export, though; the whole thing.

Mr. SPRINGER. It says "along the dividing lines between the United States and foreign countries and along the lines of transportation from all parts of the United States to ports from which live stock is exported, and make report of the results," etc.

Representative WILLIAMS. The Secretary has been exercising the interstate-commerce right, but not the foreign commerce. By that he has foreign-commerce powers.

Mr. SPRINGER. That is right.

The CHAIRMAN. Now, Mr. Secretary, we will be glad to hear from you.

STATEMENT OF HON. JAMES WILSON, SECRETARY OF AGRICULTURE.

Secretary WILSON. With regard to the foot-and-mouth disease, something near twenty years ago we had an importation of foot-and-mouth disease from some foreign country, I forget where. I was a member of the House then and a member of this committee. The animals had to be driven from the ship a mile or more to the quarantine ground. They were so driven. A farmer came in from the country and drove a yoke of oxen across the track, and they got foot-and-mouth disease by just crossing the track.

The CHAIRMAN. That was in Portland, was it not?

Secretary WILSON. That was at Portland, Me. I remember Tom Reed in those days wanted to get Congress to do something about paying for them afterwards, and we did not do anything at that time.

About ten or twelve days ago word came to us that foot-and-mouth disease existed in New England. We made diligent inquiry, and we sent Dr. Pearson, of the College of Veterinary Science, of Philadelphia, Dr. Law, of Cornell, and one of our own experts there to be sure before we took steps looking to quarantine that that disease really did exist. The three gentlemen concurred in the opinion that it did exist. We got information that it existed in Vermont, Massachusetts, and Rhode Island, and there was something said of Connecticut. We quarantined those four States. The impression on our minds then was that we were in danger of having our exports from every port of the United States shut out by the British people.

Some part of continental Europe has this foot-and-mouth disease all the time. They never exterminate it. I suppose the reason is they divide jurisdiction. Asia has those diseases all the time. Asia is the hotbed of every animal disease and a great many human diseases that we never have in the West.

We concluded we must act promptly and shut off the port of Boston, and possibly Portland, and quarantine those States. We began to get telegrams from Minister Choate and our own agent, Mr. Ray, whom we keep over there all the time. We had no intelligence of foot-and-mouth disease being in the State of Maine nor in the State of New Hampshire at that time, but we knew if we quarantined those four States we would have the water line of the Hudson, which would be a natural barrier, and we knew nothing could get through the four States quarantined into Maine or New Hampshire. It was arranged at once to do that, and we did it promptly.

We questioned very much whether the British Government would be satisfied with that or not. They have foot-and-mouth disease in Great Britain every now and again. Six months ago they had it, and we refused to allow any animals to come to the United States from the counties or the neighborhoods in which it existed. The British people stamped it out promptly. The only two countries in the world to take hold of these diseases and stamp them out are Great Britain and the United States.

We arranged then to have Dr. Salmon go up and take a corps of expert assistants with him to ascertain the extent of the contagion and take steps to get cooperation with those States.

We prohibited shipment from the port of Boston because that great market near Boston, Brighton, was infected. Dr. Salmon has been up there a week. In short, he has made arrangements with the authorities of those several quarantined States, particularly Massachusetts, where the most of it is found; Massachusetts and Rhode Island have the most of this disease. I have had several letters from him. The estimate is that there are 3,000 animals affected or exposed.

I need not tell this Committee of Agriculture the interests involved should this disease get West. I gave Dr. Salmon authority to destroy all animals affected or exposed and urged upon him prompt and quick action along that line. I said to him: "Kill and bury or burn." It was discovered then presently that there was infection in New Hampshire, but only in one part of New Hampshire, just over the line from Vermont, and there they began to take measures so as to endeavor to clean out that State, if possible. We have not ascertained that there is any disease in Connecticut, and I am hopeful that there is none. They have asked me to lift the quarantine against Connecticut, and I tell them I have given instructions to have very diligent search made all over the State of Connecticut, and that as soon as it is shown entirely satisfactorily that there is no foot-and-mouth disease there we will lift that quarantine against Connecticut, but not until then. There is no natural barrier, no waterway, or anything of that kind, between Connecticut and the States east of it. There is such a barrier between Connecticut and New York State.

We have endeavored to get arrangements made with the people of all the surrounding States. Quarantine means that they must not ship animals across those quarantined States, and they must not ship animals out of those quarantined States. We have had a difficulty in the State of New York that surprised me somewhat. In the New York Tribune of Sunday morning I saw an interview with a man named Lederer, who is at the head of the board of health business in the city. He was describing the measures that they took with regard to animals shipped into New York from the infected districts. I at once telegraphed him that animals must not go to New York from those infected districts. He telegraphed back that animals coming from those districts were required to bring certificates with them that there was no disease in those neighborhoods. Well, that we could not permit.

I telegraphed to Governor Odell and told him what Lederer was doing and that he must take prompt action and stop the importation into the State of New York of animals from those infected districts or we would be compelled to take extreme measures with regard to the State of New York. This has not gotten into the newspapers, but you have the right to know everything we have done. I have just heard from Odell, and find that Mr. Lederer overstated the matter. Nothing goes there from quarantined States. Now, there is a grave danger, gentlemen, that we are not able to grasp the extent of the danger just now; that is, before we got any intelligence whatever about this disease in those infected States animals may possibly have been shipped west from New England.

The CHAIRMAN. Right there, Mr. Secretary, among what kinds of herds have you found it most prevalent?

Secretary WILSON. In dairy herds.

The CHAIRMAN. In common dairy herds or fancy stock?

Secretary WILSON. It is in one herd of fancy Holsteins, and there is the danger.

The CHAIRMAN. Yes; from the cattle that might be shipped West.

Secretary WILSON. I may tell you I will not allow any shipments from infected States.

The CHAIRMAN. Not now, but they might have been shipped heretofore, before the knowledge came to your Department.

Secretary WILSON. Yes.

The CHAIRMAN. It is not from the ordinary dairy cow that the danger is greatest. She probably, when she is fattened, is slaughtered right there. The great danger is from the fancy animals which are sent out to breeding farms.

Secretary WILSON. These infected States are getting the dairy cows from the Brighton market, and it is spread in that way. One car that we know of contained a shipment that has gone on into Canada. We followed it right up to have it ascertained whether it had done any mischief there. Other cars may have gone in other directions.

We want to be put in the position, if we hear of any outbreak in any part of the United States, to send a corps of men promptly, as fast as trains will take them there, to ascertain the mischief that may have been wrought to the herds that may be affected, and destroy them at once and quarantine the neighborhood, quarantine the farm where they are found, disinfect the stable and the yard, and prevent anybody from going there.

That is one thing I insisted that Dr. Salmon must do when he went up there. If he comes to a farm and finds an animal with foot-and-mouth disease, everything must be killed on the spot. It is a nice question what to do with them after they are killed. He has a large force of Italians digging graves, but that is very expensive. They want pretty good wages for doing that. He is going to try to burn them. That is the better method of disposing of dead animals, but that will be expensive.

The CHAIRMAN. I suppose there is danger of these men who are burying cattle carrying the contagion in their clothes?

Secretary WILSON. I suppose so, but I think that will be looked after also.

Representative SCOTT. Mr. Secretary, in these cases where you have ordered cattle killed in the State of Massachusetts has the killing been done directly upon your order, or was your order taken as authority for the governor to order the stock killed under the State law?

Secretary WILSON. The governor was willing to take hold and kill if I ordered, and otherwise not.

Representative SCOTT. Then the owners of the cattle are paid by the Government?

Secretary WILSON. The owners of the cattle are paid. An arrangement has been made by which we pay 70 per cent of the healthy value. They wanted 80 per cent, and our people wanted to pay 60 per cent, and we agreed upon 70 per cent.

Representative ALLEN. Do you pay them for the diseased cattle?

Secretary WILSON. The foot-and-mouth disease is something peculiar. An animal will have it and be good for nothing for quite a while and get over it. That was one reason why the governor of Massachusetts did not like to take hold and begin the killing, because they might get well. Now, by pursuing that method and letting the animals get well, we will have the condition there is on the Continent of Europe—that is, perpetual foot-and-mouth disease. Massachusetts would never get rid of it. Massachusetts would eventually come to the point of killing the animals, without any doubt, but we can not wait.

Representative ALLEN. Who makes the appraisement? Who fixes the value?

Secretary WILSON. It is made by arrangement between Dr. Salmon and the owners.

Representative WILSON. Mr. Secretary, I understand under the laws of Massachusetts it is made the duty of the governor to kill and destroy affected cattle without compensation?

Secretary WILSON. Yes; at the option of the governor, but the governor said that this was a disease of animals——

Representative WILLIAMS. We had a very excessive epidemic of charbon among the mules in the Mississippi Valley last year. One man I know lost $35,000 worth of mules. They were destroyed, and there never was the slightest pretense that the Government ought to pay for those mules. In fact, it was with exceedingly great difficulty that we got anybody to go down there from the Department of Agriculture.

Secretary WILSON. The ruminants and hogs of the United States are in danger, and horses to some extent. There is danger of a quarantine against the whole United States by the British Government, that takes nearly everything we export along that line, $45,000,000 worth a year.

The CHAIRMAN. What did you say yesterday was the value of the live stock of the United States?

Secretary WILSON. The annual live-stock product of the United States is $900,000,000 a year. That is the annual product. You gentlemen were just beginning to come here. Congress was just on the point of meeting, and it occurred to me (and I consulted Mr. Wadsworth, and he agreed with me) that prompt action must be taken. I said to him, "If we are going to stop the spread of this contagion, we must act immediately." He said, "By all means act promptly." I had to use my judgment.

I could not put the responsibility on any of my assistants. I could not put the responsibility on Dr. Salmon. I took my chances of your approval, and I have ordered everything in New England killed. At the rate we are paying now it will probably cost $100,000 for the animals. If we do not pay, people will conceal the disease from us.

The CHAIRMAN. That is the danger. That has been the experience in all Europe, has it not, Mr. Secretary?

Secretary WILSON. Yes. I was a member here when we created the Bureau of Animal Industry, in the days when pleuro-pneumonia was all over the country. It was argued pro and con. You will find the arguments back in your Congressional Record of those days. A conclusion was arrived at that where people are paid nothing they will not divulge the existence of those diseases; but if they are going to be paid 70 per cent, they will reason that they will probably get rid of the disease, and they will sell the Government what they have.

Representative HENRY. We have had just that experience in Connecticut for years. We find it policy to allow our commissioner of diseased animals to pay a nominal price. I think the State government pays for diseased animals $20, $15, $12, or $10, so that the payment of that small sum leads men to notify the commissioner of diseased animals that he has disease in his herd. If he did not have that compensation, he would conceal it or sell his stock.

Representative WILLIAMS. It is the State of Connecticut that does the paying, though.

Representative HENRY. Yes; Connecticut pays that. It costs us ten or twelve thousand dollars a year.

Secretary WILSON. In the pleuro-pneumonia outbreak Dr. Salmon went into Chicago and went into infected yards and stables, and he had a great deal of difficulty in getting the cooperation of the State of Illinois, but he finally got it. There was a pretty vigorous man Secretary of Agriculture in those days, Mr. Rusk. He told Dr. Salmon to go on and kill everything; so it was done, and pleuro-pneumonia was stamped out.

With regard to the amount that it will cost us, I do not know. If it is confined entirely to New England, several hundred thousand dollars may pay all of the expenses.

Representative WILLIAMS. Pardon me right there just one moment, because I want to get the facts of the case and precedents that are before us. In this case where Commissioner Rusk had these cattle destroyed because of pleuro-pneumonia did Congress ever make an appropriation to pay for them?

Secretary WILSON. Yes; Congress appropriated half a million dollars.

Representative WILLIAMS. There is a precedent, then?

Secretary WILSON. They appropriated half a million dollars; and he finally got the cooperation of the governor of Illinois, after a good deal of difficulty.

Here is the difficulty existing now: The governor of Illinois quarantines against not only those infected States, but the surrounding States. He quarantines to the extent that he requires a certificate accompanying the animals that go into Illinois from New York, we will say, or New Jersey. Now, the mischief of that is that it will lead the British people to suppose, perhaps, that New York has got this infection, and that is why I acted with such promptitude yesterday in wiring the chairman of the board of health in New York and wiring the governor of New York.

We want to save, of course, as many animals as possible. If the disease should get into New York, we should follow it at once, and go to work and stamp out everything, because it will mean I do not know how much to the commerce of New York as well as to the railroads of the country, and to the farmers of the country, if it should get into that State. We would have to stop exportation from that city and fall back on Baltimore and Philadelphia: but the governor of Illinois also requires that kind of a certificate from Pennsylvania. He has done mischief; but there are a great many governors and a great many different kinds of governors in the United States.

Representative GRAFF. That is so.

Secretary WILSON. We are doing the best we can with all of them. I have wired him and told him that he is running the risk of having the whole United States quarantined against by the orders in council of the British people. They act through a board there that has authority to do that.

Representative SCOTT. A moment ago you alluded to your telegram to Governor Odell and stated, among other things, that you said to him that unless he gave different instructions to his commissioner it might be necessary for you to take severe measures with the State of New York.

Secretary WILSON. Yes.

Representative SCOTT. I should like to know what you could do in that line.

Secretary WILSON. I could quarantine the State of New York and refuse to allow animals to go out of the State.

The CHAIRMAN. Just exactly as he has quarantined New England.

Secretary WILSON. Just as he has quarantined New England.

Representative WILLIAMS. In other words, if the governor renders himself liable to infection you will treat him as if he was infected?

Secretary WILSON. Precisely; but I think we can get that nonsense stopped. They have been using a great deal of care, it is true. They have been killing the animals as they could, but they should not allow them to come from those infected States at all, and Governor Odell's telegram assured me that none have come.

The possible expense in the future will be outside of New England. We are pretty well satisfied that we will stamp it out in New England, and probably $100,000 or $150,000 may cover that, and it may not. It is an expensive business. We had to arrange with a man to put on the valuation, and Dr. Salmon got a Massachusetts man in whom he had entire confidence to do that, but he has to pay that man $10 a day. A small man will not suit in cases of this sort, and quick work, such as we are compelled to use, is expensive work.

The CHAIRMAN. You are doing the appraisement through one man, then, are you, Mr. Secretary?

Secretary WILSON. Through one man who is agreed on by both sides; and, being a Massachusetts man, they will have less suspicion of his conclusions than they would of one of our men. I think it is wise for you gentlemen to give an abundance of means to do this work.

Representative ALLEN. Mr. Secretary, I would like you to describe the nature and character of the disease, how it affects cattle.

Secretary WILSON. It is a bacterial disease, that is found first between the toes of the hoof. It is itchy and painful. The animal licks it and gets it into its mouth. It causes great big blisters on the tongue. It gets into the milk and gets all through the animal. The best thing you can do is to kill them, but after a long time they will probably get over it. They are worth very little when they do get over it. A per cent of them will die. They can not eat on account of the condition of their mouths.

Representative ALLEN. They become poor and emaciated, do they?

Secretary WILSON. 'Surely. They can not eat. They become feeble.

The CHAIRMAN. Representative Capron, of Rhode Island, told me that a neighbor of his had it in his herd and he had to feed them liquid food to keep them alive.

Secretary WILSON. That is always so.

The CHAIRMAN. That is a herd that ought to be slaughtered immediately.

Secretary WILSON. Naturally so. Of course you gentlemen will fix the terms of the bill so that this money which you will appropriate will be used for this purpose only, or so much of it as may be necessary. This is a special emergency.

Representative WILLIAMS. How much do you think will be needed?

Secretary WILSON. I would appropriate a million. I think it will have a good effect on the countries to which we ship $45,000,000 worth of live animals——

The CHAIRMAN. That is the amount of our export, is it—$45,000,000?

Secretary Wilson. Our live-animal export amounted last year to forty-four and odd million dollars' worth, and the year before that around the same sum. Then the product of our animals amounts to $200,000,000 annually.

The Chairman. If they quarantine against us, that will all be stopped?

Secretary Wilson. We can not ship an animal, not one. Why, the British people sent the foot-and-mouth disease to the Argentine Confederation in South America. Those people were buying fine cattle from the British and they actually took it down there, whereupon the British Government promptly quarantined against the Argentine Republic and will not allow them to send a single animal; and the only way by which they can do that is to quarantine against countries that have it. Six months ago they had it in Great Britain, and we kept agents over there who prevented any shipments from anywhere near where that was found.

The Chairman. Even then they are quarantined when they land here, the cattle that you do allow to come in.

Secretary Wilson. We quarantine all the animals that come from there anyway. This could not have come through the quarantine, because the period of incubation is not as long as our quarantine period.

Representative Henry. What is your theory as to where this disease comes from?

Secretary Wilson. We are trying to find that out. You have up in New England, for example, people who are buying up lands and making great estates and putting fences around them, and they want a deer of a certain kind or an antelope or a sacred cow, and they sneak them in. We can not control everything about it, and every man connected with the customs business is not a saint.

A $10 bill or a $20 gold piece might get a sacred cow in there, or a hog. A wild boar might be gotten in. It might come in hay or something of that kind. We are trying to find out how it did come, if we can. I think it will have a good effect on the people across the Atlantic if the American Congress puts an abundance of money in our power to stamp it out.

Representative Scott. Do you know how much of the half million dollars appropriated for the use of Secretary Rusk was actually spent in crushing out pleuro-pneumonia?

Secretary Wilson. No; I do not know about that particular thing, but I guess it took a good share of it. This is an expensive business, and it has the effect on the Bureau of Animal Industry that it takes every available man away from there. The Bureau will find itself short of money, but that you can attend to in the appropriation bill.

Representative Scott. How much have you probably already spent?

Secretary Wilson. Oh, we have not spent anything now except for expenses.

Representative Scott. What obligations have you assumed?

Secretary Wilson. The obligation of sending those men into New England will be the largest part of it.

The Chairman. You slaughtered the New Hampshire herd, 15 head, did you not?

Secretary Wilson. That would probably be about all.

The Chairman. Up to date?

Secretary WILSON. Yes.

Representative SCOTT. I understood you to say you had already assumed obligations in the matter which will reach probably $100,000?

Secretary WILSON. Yes; I have given orders to Salmon to locate the disease, get a valuation put on satisfactory to the locality, and kill and destroy everything in that country. I had to do that. I took it for granted you wanted that done.

Representative GRAFF. What sum of money do you want?

Secretary WILSON. I advise you to appropriate a million dollars, or so much thereof as may be necessary. I do not think we will need it all; and yet, suppose we find a car has gone out West somewhere and affected a neighborhood? It is a disease that goes like a prairie fire. We would send a score of men there to kill everything in the neighborhood, if it cost $50,000 to do it. That is our only hope. When you do kill animals in a neighborhood and bury them or burn them, it is necessary to leave a man there to prevent the neighbors from going in to see the thing. They carry it away on their feet. It is necessary to go to the expense of getting material to disinfect the stables and yards.

Representative GRAFF. Have you ample authority now under the law to do everything, if you have the appropriation?

Secretary WILSON. Oh, yes.

The CHAIRMAN. I will read it to you, Mr. Graff—the appropriation bill touching upon this power to slaughter:

> And to expend any part of this sum in the purchase of diseased or exposed animals and the quarantine of the same whenever in his judgment it is essential to prevent the spread of pleuro-pneumonia, tuberculosis, or other diseases of animals from one State to another.

That is under the paragraph of "Bureau of Animal Industry" in the appropriation bill. He simply needs the money. That is all he needs.

Secretary WILSON. We are using the money now that would naturally be used for other purposes of the Bureau, such as inspecting meats, etc.

Representative GRAFF. Is that incorporated in the appropriation proposition we have here, with appropriate wording?

The CHAIRMAN. No; that stands as it is. The proposition Mr. Springer brings here is simply, as the Secretary puts it, to relieve the onus put upon us by the Supreme Court decision.

Representative HENRY. Does the Secretary advise that these two propositions be incorporated in the same bill, or that they be put in two separate bills?

Secretary WILSON. That is for the committee. You gentlemen know the temper of Congress better than I do. Probably if you could get the matter in shape that would be entirely agreed upon by yourselves you could put it all in one bill.

Representative SCOTT. Do you think it would be proper and wise, under the circumstances, to ask now for half a million dollars, with the understanding that that will certainly provide you with sufficient funds for a month or two, and then provide additional amounts in the regular appropriation bill, if you find it necessary?

Secretary WILSON. That is for the committee to decide, of course.

The CHAIRMAN. This is a short session. Congress adjourns on the 4th of March, and unless called in extra session will not be in session again until the following December, and should the emergency arise the Secretary might want the funds in the meantime. It will not be used, you know, unless it is necessary.

Secretary Wilson. This is a favorable time of the year. The snow covers the ground, and the disease does not travel as fast in intense weather like this; but when the spring opens it may have been carried to some place by a car, or it might break out after Congress has adjourned. I have the money. I am not ordering the expenditure of money that I have not, but I am ordering the expenditure of money that would naturally be used for other purposes. But I would rather stop everything else than have this thing spread all over the country. That is why I am using this money. We have the money on hand and authority to use it.

The Chairman. I think, Mr. Secretary, there is a great deal in what you say in regard to showing foreign governments that we propose to act energetically in this matter and promptly.

Representative Williams. Mr. Chairman, we can give all the money we please to the Secretary, and if we do not secure this defect that the late Supreme Court decision shows to exist in his regulations—the defect of having no legality behind them—I do not see that the money will enable him to confine that disease to where it is even now. I think the best thing would be to put this appropriation and this new bill together.

The Chairman. That is my judgment.

Representative Williams. And not to put them upon the regular appropriation bill, but bring them in as a sort of emergency affair, and explain to the House that in order to properly expend the money this added authority must be had; then put it all in one bill and let the regular appropriation take care of itself in the usual way. You can report this special bill; you can get leave from the Speaker to report it very soon.

The Chairman. I have already spoken to the Speaker about it and to Mr. Cannon.

Representative Cooney. I should like to know whether the States should not pay for the cattle.

Secretary Wilson. Take, for example, the State of Vermont. They have the disease there, but we do not know how extensively. The members of the board that have authority to act in those matters find themselves at the expiration of their lease of power, and the new board has not been appointed. Before you could get the States to act along these lines the disease would be all over the United States. That is where the difficulty is.

Representative Haugen. Do not a good many States have the authority now?

Secretary Wilson. No; or, if they have, they have no money to appropriate, as we have. They could not pay for anything. They run on close lines in the States. The New England people are very careful people. They do not have money lying around.

Representative Henry. We send it all to Iowa and Kansas.

The Chairman. But they loan it at 6 or 7 per cent there.

Secretary Wilson. I have hoped we will stamp this thing out quite promptly. I would like to lift the embargo against Connecticut just as soon as we can. This is terribly expensive to all our people. It stops the railroad people from bringing stock from the Northwest and sending it away from both Portland and Boston.

Representative HENRY. I might say, Mr. Secretary, that our commissioner for diseased animals says he does not know of an instance of foot-and-mouth disease in Connecticut. He has been trying to find one.

Secretary WILSON. And we do not; but I have written to Dr. Salmon to send agents to Connecticut and have it thoroughly inspected all along the line, and just as soon as he is satisfied there is no disease in Connecticut we will lift the embargo.

Representative HENRY. That is all we ask.

Secretary WILSON. But not until then.

Representative HENRY. That is right.

Secretary WILSON. I think that is all, Mr. Chairman.

With regard to what Judge Springer was telling you, we do not need legislation so much to move anything out of an infected district. We will not soon move things out of infected districts. The great difficulty is to get the Southwestern cattle to market across States that may demand fees, and unless we get legislation along this line the fees will be collected.

Those fellows want fees. It will be impossible ever to get anything from Texas to the Chicago market, because they want fees everywhere. They have the Supreme Court of the United States saying so, and all our difficulties along these lines have been with regard to the districts south of our quarantine lines. Whenever we can let them bring animals to market that can be safely brought we always let them do it, and we keep a large force of men watching those lines. There will not be much difficulty in the Northern States along those lines, and I will not allow an animal to be moved out of an infected district—not a single animal—until we can lift the quarantine with safety.

Mr. SPRINGER. Mr. Secretary, as soon as you are satisfied the disease does not exist, and it is safe to ship cattle, then this legislation will be necessary in order to give you power to issue permits to take it out.

Secretary WILSON. I know that. We need that legislation. I gave the chairman a bill, prepared in our Department, along these lines, to consider with the one you prepared. We need legislation as well as money.

Representative MOODY. We have a great deal of trouble down in the Southern country with the tick question in the mountains.

Secretary WILSON. That is where I need authority all the time, and all the authority you can give me, in order to take care of the infection from the tick down there, and to let animals come north that are not infected.

Representative MOODY. Sometimes it gets among our cattle and kills the best in the county.

Secretary WILSON. Why, there are localities in the South that never had a tick, right inside of our quarantine lines, and when they move animals from localities that have ticks of course they should be allowed to ship them if they are not affected. Ticks only live under certain conditions. On the high rolling lands of the South there are no ticks. They are down in the swamps.

The CHAIRMAN. Mr. Secretary, from just glancing at this bill you brought up from the Department I am inclined to think it does not cover the point made by the bill offered by Judge Springer, but is rather meant to give you additional powers which perhaps you must possess under the general law; but the general law provides as follows:

> The Secretary of Agriculture is hereby authorized to use any part of this sum he may deem necessary or expedient, in such manner as he may think best, in the collection of information concerning live stock, dairy and other animal products, and to prevent the spread of pleuro-pneumonia, blackleg, tuberculosis, sheep scab, glanders or farcy, hog cholera, and other diseases of animals, and for this purpose to employ as many persons in the city of Washington or elsewhere as he may deem necessary, and to expend any part of this sum in the purchase and destruction of diseased or exposed animals and the quarantine of the same whenever in his judgment it is essential to prevent the spread of pleuro-pneumonia, tuberculosis, or other diseases of animals from one State to another.

I think that gives you all the power you need. All you need, in my judgment, is the money to slaughter and bury and such other necessary expenses as would naturally be incurred in doing that work. Then you need the bill that Mr. Springer has offered the committee amending the law—or perhaps it is a new law—giving you the power to furnish these certificates.

Secretary WILSON. I have not had time to look into that, but we have been preparing it, and I thought I would bring it up here.

The CHAIRMAN. I have glanced over it hastily, and it seems to me it is sort of regranting to you the powers already granted to you in the appropriation bill in the general law.

Representative SCOTT. Would it not be a good idea to have a small subcommittee appointed to draft that bill and submit it to the full committee, Mr. Chairman? It is pretty hard to discuss a matter of that kind in full committee.

The CHAIRMAN. We will take that up in executive session as soon as we are through with the Secretary, and I think perhaps the Secretary and Mr. Springer had better be with us on that occasion, as they are thoroughly conversant with it, perhaps more so than we are. The Chair, with the consent of the committee, will appoint a subcommittee to do that work in connection with Mr. Springer and the Secretary.

Representative HENRY. I move that the chairman appoint a subcommittee to draft a bill.

The CHAIRMAN. A subcommittee of how many?

Representative HENRY. Say five members.

Representative SCOTT. The committee should consist of three or five, with the chairman ex officio chairman, of course.

Representative HENRY. Yes.

The CHAIRMAN. The Chair will do that. That subcommittee had better meet immediately, with the Secretary and Mr. Springer. The Chair will appoint Mr. Scott, Mr. Graff, Mr. Williams, and Mr. Allen. The committee will now take a recess until 2 o'clock, at which time we will hear the gentlemen representing the Bureau of Forestry.

The committee (at 12.15 p. m.) took a recess until 2 o'clock p. m.

SUBCOMMITTEE OF COMMITTEE ON AGRICULTURE,
HOUSE OF REPRESENTATIVES,
Washington, D. C., December 10, 1902.

The subcommittee met at 2 o'clock p. m., Hon. J. W. Wadsworth in the chair.

STATEMENT OF OVERTON W. PRICE, REPRESENTING THE BUREAU OF FORESTRY, DEPARTMENT OF AGRICULTURE.

The CHAIRMAN. Gentlemen, Mr. Price is here, representing the Bureau of Forestry. That will be found on page 14. I do not see any change in the language of your item, Mr. Price.

Mr. PRICE. There has been no change, except the addition of the words "and forest by-products," under forest investigations.

The CHAIRMAN. You are asking an increase of how much?

Mr. PRICE. From $291,860 to $375,000.

The CHAIRMAN. You are not asking any increase in the statutory salaries at all?

Mr. PRICE. We are not asking an increase in the statutory salaries.

The CHAIRMAN. It is in the lump-sum appropriation?

Mr. PRICE. Yes, sir.

The CHAIRMAN. Kindly tell the committee of the work the Bureau has been doing for the past year, and then give the specific needs for this increase.

Mr. PRICE. I have a statement here that was prepared by Mr. Pinchot for that specific purpose, and if I may read that statement I think it covers the ground fully.

NOTES UPON THE ESTIMATES OF THE BUREAU OF FORESTRY, 1903–1904.

When the Division of Forestry began active field work four years ago its force consisted of 11 persons, of whom but 2 were practical foresters. It was wholly without instruments, and almost wholly without the detailed knowledge of trees and forest regions upon which forestry is based. Not an acre of forest had been put under management as a result of previous effort by the division. Public sentiment expressed in Congress was against the division, which had been asked in effect to show cause why it should not be discontinued.

Since that time a remarkable change in public sentiment has taken place, both in Congress and in the country at large. There was awakened a widespread desire among forest owners to apply forestry to their lands. Public interest in forestry increased with unprecedented rapidity, as was evidenced by the growing space given to forest subjects in the public prints. A forest school was founded to train American foresters along the lines of American forestry, and young men in considerable numbers were partially educated in forestry in the Department of Agriculture.

Forestry in the United States had been almost entirely neglected. Our Government was many decades behind that of other civilized nations in its dealings with the forest. It has as yet only begun on a wiser course, but a good beginning has been made. It would be peculiarly harmful and unfortunate to check or retard the onward movement at the present time.

In four hours the Bureau of Forestry has succeeded in introducing practical forestry on nearly 400,000 acres of private lands and has prepared plans for planting more than 6,000 acres. During the same period the requests for assistance reached about 5,000,000 acres. Nothing prevents the introduction of forestry on this great area of forest except the insufficiency of the Bureau of Forestry to give advice and assistance, all the expenses of which, except the salary of the Government experts, the forest owners pay. The great majority of American forest lands are in private hands. The checking of their rapidly increasing destruction and the introduction of practical forestry upon them depends directly upon the ability of the Bureau of Forestry to give the indispensable help.

Practical forestry upon the national forest reserves and the military wood and timber reservations likewise depends upon this Bureau. Requests for working plans for conservative forestry have been made by the Secretary of the Interior and the Secretary of War to the extent of nearly 60,000,000 acres, and the Bureau awaits larger powers to proceed more rapidly with this most necessary work. The forest commissions or other official agents of every State that concerns itself with forest matters are in touch with the Bureau, and in many cases are being given practical assistance on the ground. The latter, in nearly all cases, is paid for in part by the States interested, but the total demand on the resources of the Bureau from this source is large.

Vast areas of our country, as in Michigan, have been denuded by forest fires. The reestablishment of forests upon such of these lands as are not agricultural in character is a problem of the first importance, upon which the Bureau is actively but as yet inadequately at work. It is dealing likewise, under conditions of the utmost promise, with problems of tree planting in the East, and especially in the treeless West, where it is in active cooperation with farmers in every Middle Western State. This problem is an immense one, but the attack upon it is well begun.

While the progress of the forest work of the Department of Agriculture, seen from the rear, is not unsatisfactory, seen in the light of the work that must be done, if even a portion of our forests is to be saved, it is utterly insignificant. It has proceeded hitherto as rapidly as the scanty methods of forest education would supply men, and its growth has been normal and safe. In view of the greater product of the forest schools and the immensely growing demand upon its services, it might hereafter safely increase its rate of progress. The estimates submitted provide, however, for a percentage of increase but half as great as the smallest previous percentage since the change in policy began.

The newly adopted policy of national irrigation has already begun, and in the future will very greatly continue, to increase the responsibilities of the Bureau of Forestry, with the increase of public appreciation of the forests in the West. In the East, too, the protection of forests for their influence on the water supply has made heavy demands on this Bureau, while water companies, or cities which control their own waterworks, in ever increasing numbers, are applying to it for advice and assistance in protecting their sources of supply.

To check the growth of the Bureau of Forestry at this time will likewise check the spread of public sentiment in favor of forest protection. It will dull the desire of forest owners—applicants to the Bureau—some of whom have already waited for their turn until their patience is almost exhausted for practical forestry. It will dampen the willingness of young men of the right stamp to make forestry their profession, because they look forward with practical unanimity to the Government service. A single frost, which would pass over a mature tree without effect, will often injure and retard for years the growth of a healthy seedling. I conceive the Bureau of Forestry to be in precisely that situation.

The estimates for the Bureau of Forestry contemplate an increase from $291,860 to $375,000, or $83,140. These sums are divided among the different branches of the Bureau's work as follows:

	1904.	1903.	Increase.
Office of the forester	$29, 880	$21, 860	$8, 020
Management	119, 550	95, 000	24, 550
Investigation	39, 690	35, 000	4, 690
Products	41, 900	30, 000	11, 900
Extension	63, 980	40, 000	23, 980
Records	80, 000	70, 000	10, 000
Total	375, 000	291, 860	83, 140

The largest amount is for the Division of Forest Management, to provide for the preparation of working plans for the many millions of acres which await attention. As in the case of every other branch of the Bureau, the trained men necessary for the work covered by the estimates are already in sight. The next largest increase, of $23,980, is for forest extension, which includes the reclamation of burned lands, tree planting East and West, the control of drifting sands, and other important work.

An increase of $4,690 is estimated for forest investigation, to cover the progress of most important work in originating and applying a method of gathering naval stores which will check the otherwise inevitable destruction of all the long leaf pine forests of the South. A most promising beginning has already been made. The work of the Bureau in dendro-chemistry, which includes all chemical uses of wood, the search for new species of trees available for paper pulp, and the utilization of gums and other tree products from the Philippine Islands is also covered here, as well as a beginning in timber statistics.

The increase in the Division of Forest Products of $11,900 is intended to cover new work in timber testing, which is urgently demanded, especially in the Northwest. This work the Bureau is making thoroughly practical and usable by full consultation with prominent engineers. It covers also investigations of peculiar value, both direct and indirect, into the uses and supplies of construction timber of various kinds, and especially for railroads, which are becoming most potent helpers toward the introduction of forestry.

The increase for the Division of Records, $10,000, includes $4,000 additional for rent, one additional clerk, and small increases for instruments, furniture, and supplies. The estimate of $15,000 for printing, while in itself $5,000 less than would be desirable, will have to be covered chiefly by the contingent fund in the office of the Forester.

Representative SCOTT. Mr. Chairman, I would like to read a letter, which I believe you will all hear with interest, and get the opinion of Mr. Price on it. This letter is from a man living in Colorado who has been engaged for nearly thirty years in farming, ranching, and in running a sawmill in a small way. I go out there every summer and know him well. There were a number of fires in that vicinity during last summer. After I returned home he wrote me this letter:

> In regard to the proposed forest reserve west of us—

That is, on the continental divide, about 100 miles northwest of Denver—

> I am or would be sorry to have it set aside, as it certainly has been the means or cause of fires in other parts of the States where such reservations have been set aside.

My idea has been that these forest reservations were set aside with a view of protecting them from fires, but you will notice that this man, after thirty years of experience, gives it as his opinion that fires have resulted as a consequence of the setting aside of the reservation.

He proceeds:

> The people say that if they can get no benefit from the timber, they can burn it and make some food for stock; and the people that are interested in the preservation of the forests for water and storage purposes are far from the reservation. People living near and on the reserve are interested in stock more or less, and this being an age of every one for himself and every one else supposed to be against him, these same stockmen do not hesitate to destroy timber if they can make more room for stock near them. This has proven to be the case in nearly every instance, and will in this, I am quite certain.
>
> You hear talk of the timber thieves doing the burning, but such is not the case. One sawmillman will protect a forest in which he is interested more than a company of soldiers or all the forest writers in the country. The way the forest reserves are protected is a farce, and the worst kind of a one. I have always contended that if the millmen were engaged to go into forest reserves under good rules governing his work, it would go further toward the good sought than the present way.
>
> The ranchmen in the valley east of us have asked for this reserve, and their main object is to hold the snow. They do not want the timber cut and they complain of the timber thieves or sawmillmen. As I said before, they are the only protection to the timber we have as yet, and I stand ready to prove that if every marketable tree in the forest was cut and the young growth left, together with the crop, it would be better for holding the snow and moisture than it is now.

I read this for the purpose of asking Mr. Price if he concurs in that opinion, that the timber could be cut and the young growth preserved, and the result be just as favorable for the preservation of snow and moisture in other forms.

Mr. PRICE. I concur in that opinion most heartily, sir. I think the result would probably be more favorable than if no cutting was done. You get a denser forest if you cut conservatively than if you do not cut at all.

Representative SCOTT. Your Bureau has nothing to do with the care and protection of these forest reservations?

Mr. PRICE. It has absolutely no official connection with the administration of the national forest reserves. The bill for the transfer of the forest reserves came up last year and was defeated.

Representative WILLIAMS. That was one of the objects we had in view of consolidating those things, so as to bring the public forests under a forestry law and the forestry regulations.

Representative SCOTT. You have had some experience in forestry in these reservations. Does that experience bear out the statement made here that a reservation which has been set aside is more likely to be attacked by fire than a forest which has not been set aside?

Mr. PRICE. The protection of the reserves from fire has been poor, upon the whole. It is possible that in some of the reserves there have been more fires since they have been created.

Representative HENRY. Your department has nothing to do with fires?

Mr. PRICE. It has nothing to do with the protection of the forest reserves from fire.

Representative HENRY. That is in the Interior Department?

Mr. PRICE. Yes, sir; in the General Land Office of the Department of the Interior.

The CHAIRMAN. What is the total increase you ask for?

Mr. PRICE. The total increase is from $291,860 to $375,000, or an increase of $83,140.

Representative SCOTT. That is an increase of how much in percentage; about 30 per cent?

Mr. PRICE. A little over 28 per cent.

The CHAIRMAN. How pressing is the demand for this work, Mr. Price?

Mr. PRICE. It is very pressing indeed, sir, particularly along two lines, tree planting and forest working plans. The circular in which practical advice and assistance was offered to private owners of forest land was printed in October, 1898. Since that date we have had applications for working plans for over 5,000,000 acres of private forest land. Every part of that area requires careful study, and the preparation of detailed working plans is necessarily a slow business. For instance, a party of ten men would not generally make a working plan for an area of more than 50,000 acres in one season. We have also applications for working plans for all the national forest reserves and for the military wood and timber reserves. These comprise a total area of over 60,000,000 acres.

The CHAIRMAN. Just describe one of these working plans.

Mr. PRICE. We are now carrying on the field work necessary to a working plan for the largest area of private forest which we have undertaken as yet. This is the tract of the Kirby Lumber Company in southeastern Texas, and comprises about 1,250,000 acres. The Kirby Lumber Company pays all expenses of the work except the salaries of our agents. Their contribution is $7,500. The completed working plan will include:

1. A study of the present method of lumbering and its effect upon the forest, in order to fix upon the practicable modifications which would hasten the production and heighten the quality of a second crop.

2. The long-leaf pine—the rate at which it produces timber, its reproduction, and the effect of fire upon it.

3. The fire problem, in order to devise a simple and effective system of protection against fire.

4. The railroad-tie industry—its effect upon the forest, and its advisability under the methods and to the diameter to which trees are now cut for ties, from a business point of view.

The completed working plan will outline the best business policy for the management of the tract, based upon a thoroughly expert examination.

The CHAIRMAN. I can see that the Government can teach them, but I do not know why the Government should be put to any great expense.

Mr. PRICE. The Government is put to no expense except the salaries of its agents.

The CHAIRMAN. How many men have you down there?

Mr. PRICE. Thirty men, of whom all but the men in charge are receiving $25 a month as student assistants. Those in charge are trained men, receiving $1,000 and upward a year. The result of the work of the Bureau in the preparation of working plans is exceedingly beneficial along several lines. In the first place, it gets started practical examples of conservative forest management, which serve as object lessons for other tracts. It also leads to the collection of exceedingly valuable data—exceedingly valuable for every forest owner in that region—data upon the rate of growth of forest trees, upon the present methods of lumbering, and upon conservative methods of lumbering advisable to avoid waste.

The CHAIRMAN. How long will it take you to complete that work?

Mr. PRICE. It will be done, I hope, this winter, but only in a tentative way. We put the men down there on the 15th of November. It is a fever country, and we can not keep them there later than the 15th of March. We shall probably have to carry it on another winter.

Representative HENRY. In this Texas forest where you are working, your experts, as I understand, go through the forest and mark the trees for the lumbermen to cut?

Mr. PRICE. In this case they will measure the stand of timber on a portion of the area in order to get an approximate figure by which to estimate the whole of it. They will study the rate of growth of the timber trees and the other points involved in forest management, and they will formulate rules for the marking. The owners will be called upon to do their own marking. Wherever our working plans are applied it is entirely at the expense of the owner.

Representative HENRY. You do not furnish markings; you just give general directions.

Mr. PRICE. We give directions for conservative management. Their application rests entirely with the owner.

The CHAIRMAN. In regard to tree planting, what do you want to do?

Mr. PRICE. The tree-planting plans are prepared at the cost of the Bureau. Their expense is very small. They involve as a rule merely the visit of an agent and two or three days spent upon the land to be planted.

Representative SCOTT. Do you do any work in the way of landscape gardening?

Mr. PRICE. None at all. We do not go into that field.

The CHAIRMAN. You do not plant trees for those people?

Mr. PRICE. No; we merely give them directions. We prepare a plan for planting—a sketch map of their land on which is indicated what and where they shall plant.

The CHAIRMAN. Do you send a man to each individual applicant or do you have a general publication that meets them all?

Mr. PRICE. Wherever possible we answer the application by publications. Where there are a good many prospective tree planters we send a man to to the neighborhood, and there he gives directions to the applicants.

The CHAIRMAN. Where is this; principally in the West?

Mr. PRICE. It is largely in the Middle West, but also in New England.

The CHAIRMAN. These are forest trees altogether?

Mr. PRICE. Entirely.

The CHAIRMAN. They are not for ornamental trees?

Mr. PRICE. No.

Representative SCOTT. And not for fruit?

Mr. PRICE. No.

Representative HENRY. We are planting trees in New England at the State's expense. The State is buying land at a given price and planting trees.

Representative GRAFF. Has there been any study by the Agricultural Department of the effects upon the rainfall of semiarid regions by the planting of trees?

Mr. PRICE. We have made a study in the San Bernardino Mountains, in California, of the effect of the forest cover upon the run-off, in order to get some data by which to prove logically the thing we all know, that where the headwaters of the stream are unforested, we have more floods and more droughts.

Representative SCOTT. Mr. Graff's question, I think, alluded to the rainfall.

Representative GRAFF. My question was not directed exactly to that, but to at least a popular notion——

Mr. PRICE. As to the quantity of the rainfall, and the frequency of the rainfall, as influenced by forests?

Representative GRAFF. That as we advance the growth of trees farther west, into these semiarid regions, the rainfall is increased somewhat thereby?

Mr. PRICE. We are pursuing no investigations of that kind, sir.

Representative GRAFF. Is that a scientific fact that is recognized?

Mr. PRICE. It never has been so established. It is consideraed to be a fact by many scientists, but it has never been logically proved.

Representative HENRY. What is the experience in Kansas in that respect?

Representative SCOTT. Records have been kept there over forty years and they show no change at all. Although that State is vastly better forested now than it was forty years ago, so far as the records show there has been no change in the rainfall.

The CHAIRMAN. At one time it was thought the rails of the Union Pacific Railroad attracted rain storms. Do you remember that, Mr. Scott?

Mr. SCOTT. Yes.

The CHAIRMAN. This is a pretty big increase, Mr. Price.

Mr. PRICE. It is the lowest proportionate increase we have asked for yet.

The CHAIRMAN. But we have advanced you very fast.

Mr. PRICE. That is true, sir; but the work has advanced very rapidly, too.

The CHAIRMAN. I am afraid you are trying to take advantage of our generosity.

Mr. PRICE. I hope not, sir.

The CHAIRMAN. I think the committee appreciates the importance of this work. The only question is how fast it can go on and go on profitably.

Mr. PRICE. Mr. Chairman, we have reached a point now that we have never reached before. Up until now the chief difficulty was in the scarcity of trained men. It was not so much a question of money as it was a question of men to do the work. The forest schools are now in full swing. Cornell has 70 students, Yale 40, and Biltmore 16; so there is no dearth of men any longer. The great check to our progress has been removed in that way.

The CHAIRMAN. You mean the great check to the expenditures of money has been removed?

Mr. PRICE. That is true in this case, sir. We need money to bring the men and the work together.

Representative SCOTT. Can you outline briefly the course of study which these schools offer?

Mr. PRICE. The course of instruction?

Representative SCOTT. Yes.

Mr. PRICE. Yes; I think I can. Biltmore is an informal school with a one-year's course. It is conducted by the forester of Mr. George Vanderbilt's estate at Biltmore, N. C. Cornell has a four-years' course; Yale has a two-years' course. At Yale they admit only graduates of colleges of good standing. The course is practically all technical forestry. At Cornell the course includes allied sciences. For instance, at Cornell they include geology, chemistry, and botany, and other subjects which are necessary to forestry. At Yale the post-graduate students admitted have the requisite knowledge of those subjects, and the instruction is confined mainly to technical matters.

Representative SCOTT. That technical instruction is what I would like to have information about.

Mr. PRICE. The chief lines are silviculture, forest measurements, forest management, forest technology, lumbering, forest protection, and forest administration.

Representative GRAFF. When did Mr. Pinchot go to the Philippine Islands?

Mr. PRICE. He sailed on August 30. He went out the eastern way and will get here early in January.

Representative GRAFF. Had he made out these estimates?

Mr. PRICE. He made out these estimates; yes.

The CHAIRMAN. Does the committee want to question Mr. Price any further?

Representative GRAFF. I do not feel like asking him to go over the same ground he has been over while I was not present.

Representative COONEY. All you have stated to us in regard to the work of the Department relates chiefly to the gathering of information, in substance?

Mr. PRICE. Not entirely, sir. It relates largely to gathering information, but it relates also very largely to the application of practical forestry, both in tree planting and in working plans for the conservative management of forest land.

The CHAIRMAN. Are you doing any work in Mississippi at all?

Mr. PRICE. We are not doing any work in Mississippi now?

The CHAIRMAN. Have you done any?

Mr. PRICE. We have done none yet. We have some working plans to make in Mississippi on tracts of long-leaf pine. We have applications from two large tracts.

The CHAIRMAN. What part of Mississippi?

Mr. PRICE. The southeastern part.

Representative WILLIAMS. That is a very important problem there.

Mr. PRICE. We hope to go in there after we get through with the Texas work.

Representative WILLIAMS. There is a ridge which they call Walnut Ridge, a valuable formation, that runs all the way down from the bluffs at Memphis to the bluffs at Baton Rouge. As soon as the trees are taken off and that land is cleared, it washes and makes a gully with a peculiar perpendicularity or stratification, almost, in the clay. Sliding takes place afterwards, and I had these men that were down there examine that and make some report upon it. Some of these days I would like the forest men to look at it and suggest methods of reforestation.

Mr. PRICE. We would be glad to do it.

Representative **Henry**. What is the growth?

Representative **Williams**. Walnut, oak, beech, hickory—hard woods of every sort.

Representative **Scott**. Do you think the work of your Bureau could be made more effective, particularly in its relation to the forest reservations, if you were under the direction of the Secretary of the Interior?

Mr. **Price**. No, sir; I think it would be less effective.

Representative **Scott**. You think it would be no advantage to be in the bureau which has charge of the administration of the reservations and the disposal of the lands?

Mr. **Price**. I do not, sir. I think, under the circumstances, it would be a marked disadvantage.

The **Chairman**. What do you think would be the disadvantage?

Mr. **Price**. The transfer of the Bureau of Forestry to the Department of the Interior is, in my judgment, inadvisable for the following reasons:

Forestry is a component part of agriculture. Every source of wealth grown from the soil is in the sphere of the Department of Agriculture; hence the forest work rightly belongs to it. The production of timber is as naturally within the scope of the Department of Agriculture as is the production of field crops. To take forestry from agriculture would be to mar the unity and limit the effectiveness of the former. The Bureau of Forestry is now filling its proper sphere in the Department of Agriculture. The fact that it is cooperating with three other bureaus of that Department is useful in showing its close relation to other branches of agricultural work. These are the Bureau of Chemistry, in cooperation with which the Bureau of Forestry is carrying on dendrochemical operations; the Bureau of Plant Industry, in cooperation with which it is conducting studies of timber diseases, and the Bureau of Entomology, in cooperation with which it is investigating forest insects.

A large part of the work of the Bureau of Forestry is in cooperation with farmers and other owners of forest land. Its work for private owners can not legitimately be transferred to the Interior Department. It is entirely practical to transfer the work of the Interior Department in the Government forests to the Department of Agriculture. The amount of forest in farms alone is more than four times greater than the whole area of reserves, while the private land now being lumbered under the direction and control of the Bureau of Forestry is many times greater than the area being cut over in all the forest reserves together. The Department of Agriculture is much more familiar with the problems and conditions of the forest reserves than is the General Land Office, a fact shown by the request of the Interior Department not only for working plans for practical forestry but for reports on grazing and other subjects. Except for the men loaned by the Department of Agriculture, not a single person now engaged in the Division of Forestry in the General Land Office in Washington has ever been on a forest reserve. The most important problems of the forest reserves are already being dealt with by the Department of Agriculture. The Department of Agriculture is organized to assist production from the soil and is already administering large interests involving practical and legal questions of great importance, as in the Biological Survey and the Bureau of Animal Industry. The Land Office was organized, not to administer, but to dispose of the public lands, and is necessarily hampered and impeded by the form of its organization and office system. The Interior Department is overloaded and has officially asked to be relieved of its forest-reserve work; the Department of Agriculture is thoroughly prepared to handle it.

In my judgment the reasons given are sufficient to show that the proper place for the Bureau of Forestry is in the Department of Agriculture. Were there strong reasons for its transfer to the Interior Department, I nevertheless believe that this transfer would be of questionable advisability at the present time. The Bureau of Forestry has already established a relationship with other bureaus of the Department of Agriculture. Its organization and administration are based upon the policy of that Department. Its transfer would be productive of harm not only in taking away from the Department of Agriculture an important branch of agricultural science, but would also greatly retard the development of the Bureau of Forestry through a drastic change in the conditions under which it has reached its present degree of effectiveness.

Representative SCOTT. The fact that your Bureau had been called upon to send foresters in the Land Office suggested the question which I asked.

Mr. PRICE. I see.

Representative SCOTT. Whether if a few could be used advantageously in that Department the whole Bureau could not be transferred.

Mr. PRICE. In my judgment you would get better results through a transfer the other way.

Representative COONEY. You ask an appropriation for the extension of forestry, Mr. Price. I would like to know how that extension is made.

Mr. PRICE. By the division of forest extension, sir.

Representative COONEY. This is what I want to know: Is the Bureau engaged in planting trees and taking care of them at any place?

Mr. PRICE. It is engaged only in making recommendations for tree planting.

Representative COONEY. It is left in charge of private individuals?

Mr. PRICE. It merely gives practical advice. The execution of the work is left entirely to the private owner.

Representative COONEY. Is there any money furnished to these parties?

Mr. PRICE. Absolutely nothing, sir.

Representative COONEY. What do you furnish them?

Mr. PRICE. We furnish them merely the expert advice. We send a man for that purpose.

Representative COONEY. Do you furnish plants—trees?

Mr. PRICE. Nothing, sir; we furnish no plants, no trees, no seed.

Representative COONEY. There is really nothing, then, contributed by the Bureau?

The CHAIRMAN. You do not furnish any trees at all?

Mr. PRICE. None whatever. That was discontinued when Mr. Pinchot came in.

The CHAIRMAN. Was it done before?

Mr. PRICE. It was, but it has not been done since. We furnish only the planting plan, based on a thorough study on the ground.

The CHAIRMAN. If this committee should think that increase unnecessary, what would be the effect on your Bureau?

Mr. PRICE. The effect would be, sir——

The CHAIRMAN. You could not do quite as much work. That is all.

Mr. PRICE. We could not do as much work. The effect would be particularly bad in that a great many men have taken up forestry, to a portion of whom, under an increase, we can give employment. I do not mean that it is the duty of the Bureau to give those men employment, but they are good men, capable of valuable work, and it would check the growing tendency of young men of the right stamp to make forestry their profession.

The CHAIRMAN. Are they employed now, under the present appropriation?

Mr. PRICE. Some are; but there will be a great many more graduates by the 1st of July, and they look with practical unanimity to the Government work.

The CHAIRMAN. You will have to reach a limit on that.

Mr. PRICE. We certainly shall, but I do not think we have reached it yet, sir. I mean there is more work than there are men, so far. The reserve service alone requires a large number of trained men.

The CHAIRMAN. Are any of these men being employed by any of the big lumber companies?

Mr. PRICE. The field is opening up, sir; also employment by States, and by private owners generally.

Representative SCOTT. Mr. Price, as soon as the schools have turned out men competent to give this expert advice, would it not be proper for the Government to withdraw that sort of thing and not enter into the competition?

Mr. PRICE. I think it will in course of time, but I do not think that time has come yet.

The CHAIRMAN. This appropriation is growing very fast; and when you once get it established you never can cut it down. These young fellows are being educated, and the thing is being agitated all over the country, and sufficient examples are furnished. Has not the Government, then, performed all it ought to do in the matter?

Mr. PRICE. When those conditions have been reached it will be time to limit the work, in my judgment.

The CHAIRMAN. Then let these young fellows graduating from the prominent schools of forestry go to the lumber companies, etc.

Mr. PRICE. But only a very small part of our appropriation is spent in cooperation with private owners. They pay the total expenses of the work, except the salaries of the men engaged in it. The sum total spent in cooperation with private owners is very small indeed. It is in connection with the working plans for public lands and in following important lines of investigation that our chief expenditure comes.

Representative SCOTT. Who carries into effect these plans which you prepare?

Mr. PRICE. The division of forestry of the Land Office.

Representative SCOTT. Has that division done anything in the direction of reforestation?

Mr. PRICE. It has done something in the way of more effective management of the reserve.

The CHAIRMAN. You say the chief demand comes from the Government itself?

Mr. PRICE. A large demand for expenditures comes from the Government itself.

Representative SCOTT. Do you know how many men are employed in the forestry division of the Interior Department?

Mr. PRICE. Including superintendents, supervisors, and rangers, I suppose there are about 250 men. I do not know the exact number.

Representative **Scott**. But they have not begun yet the actual work of reforestation?

Mr. **Price**. They are doing no planting, nor do I think they will do any for several years to come. The reserve management for a good many years will consist in their protection and in selling the timber under permit and in the application of conservative methods in the lumbering of this timber. The necessity for planting has not yet generally arisen, and I doubt if it will do so for some time to come. They can still cut in such a way as to insure a second crop.

Representative **Scott**. When an area of forest has been burned—say a square mile out of the middle of a forest of 50 square miles—could that square mile be reforested materially faster by artificial means than by natural means?

Mr. **Price**. That would depend on what was left living upon the square mile. It would also depend upon the topography and upon the forest around the burned area. If there were still some live trees left they would seed up the area, or if there was green timber around it seed might be blown in.

The **Chairman**. You surprise me rather when you tell me that the chief demand for forestry work comes from the Government.

Mr. **Price**. Mr. Chairman, I did not mean to say the chief demand, but a large demand for expenditures. A very large demand, a demand for assistance and for information comes overwhelmingly from the public; but a very large demand for the expenditure of money comes from the Government. In addition to the cooperation which I mentioned upon the national forest reserves and the military wood and timber reserves, we also had a request from the Secretary of the Interior this autumn to make working plans for three Indian reservations in Wisconsin, for which we pay. We are also conducting work in Minnesota under the Morris bill upon the Chippewa Indian Reservation, and we carry on a good deal of work in the preparation of special reports upon grazing and kindred matters for which we must pay entirely.

The **Chairman**. That is, grazing on public lands?

Mr. **Price**. Yes, sir.

Representative **Henry**. I suppose the Government has the cream of the talent who graduate at Yale and Cornell, has it not?

Mr. **Price**. Men turn naturally to the Government service. It has the call for the best men.

Representative **Henry**. They prefer the Government service?

Mr. **Price**. They prefer the Government service. It has opportunities that the other service has not.

The **Chairman**. It is quite a question how long you can go on this way before your market is overstocked with talent.

Mr. **Price**. Yes; matters will have to adjust themselves. There is no doubt the tendency will be, for the first few years, for too many men to go to the forest schools; but, as is the case abroad—in Germany, and elsewhere in Europe—it will settle down to about the number which will be required each year.

The **Chairman**. The Government can not need many more, can it, for its own work?

Mr. **Price**. The Government will need a great many more for its own work upon the reserves and elsewhere. In the forest-reserve service there are no thoroughly trained foresters except the men who were sent by the Bureau to the division of forestry in the Land Office. There are no other technically trained men. A great many technically trained men are needed now in the reserve service.

The CHAIRMAN. The Government reserves are not so numerous or so immense but what they can still be taken care of, can they not? I do not mean to do it in a day, but I mean a sufficient corps would do it sufficiently fast.

Mr. PRICE. They cover now 60,000,000 acres. There are, I think, over fifty reserves. Many of them should have a man there all the time—a thoroughly trained man to take charge—and as the demand for timber increases in the reserve, as it is doing now very rapidly, the demand for trained men will be greater and greater, in my judgment.

The CHAIRMAN. Is any timber being cut on these reserves now?

Mr. PRICE. There is; yes.

The CHAIRMAN. By whom?

Mr. PRICE. It is being cut by private owners and by companies under permit and under regulations. It requires a forester to enforce those regulations most effectively.

The CHAIRMAN. They are cutting into what you might call the ripe timber, the finished timber?

Mr. PRICE. Yes, sir.

The CHAIRMAN. That the Government sells.

Mr. PRICE. That the Government sells. In the Black Hills Forest Reserve, for example, there are very large quantities of timber being cut every year for use in the mines.

The CHAIRMAN. Is that all under control?

Mr. PRICE. Yes. Applications are made in regular form. When applications for the purchase of timber are granted rules are enforced under which the timber is cut.

Representative GRAFF. Is there any prospect of the revenues that come from this timber which is cut under permit amounting to enough to pay for the expenses at least of maintaining these reserves?

Mr. PRICE. In my judgment it will not be long before the reserves can be made self-supporting.

Representative GRAFF. Are these revenues increasing from year to year?

Mr. PRICE. They are increasing from year to year.

The CHAIRMAN. Into what fund are they turned now? Into what do these revenues go?

Mr. PRICE. They are turned directly into the Treasury.

The CHAIRMAN. Yes, into the Treasury; but are they turned in for any specific purpose, or just into the general fund?

Mr. PRICE. Into the general fund, I think.

Representative HENRY. Miscellaneous.

Mr. PRICE. The miscellaneous fund. The demands for timber are increasing very rapidly, and as there are more railroads in the West and as the West settles up they can be expected to go on increasing.

The CHAIRMAN. Abroad, forest reserves are made to pay quite substantial incomes.

Mr. PRICE. Yes, sir.

The CHAIRMAN. I had a table last year showing the government reserves in Europe, and nearly all of them were a good source of income. The only question, I suppose, with this committee is to determine how fast and how far we want to go in this work. The increase has been pretty rapid. We have been lenient with them and given them large increases every year. You do not go much into the diseases of trees?

Mr. PRICE. We are studying the diseases only in cooperation with the Bureau of Plant Industry.

Representative SCOTT. I have seen a great many pine trees and spruce trees in the Rocky Mountains, dead, with long moss hanging from their branches. It looks a good deal like the moss that hangs from the live oak trees down South.

Mr. PRICE. Yes.

Representative SCOTT. It is a parasite which kills them?

Mr. PRICE. In this special case of which you speak I do not know. I am inclined to think the moss comes afterwards. I do not believe that the moss is the first cause of the death of the trees.

The CHAIRMAN. Does any member of the committee desire to ask any further questions?

Mr. PRICE. Mr. Chairman, if I might make a statement in regard to the work of the Bureau in dendro-chemistry, I would like to do so.

That is a branch of the work in which it is specified that a portion of the increase will be used. One of the most important features of work in that line is the study of improved methods of turpentine orcharding in the South. We have devised in the Bureau a method that will save not only the trees but will also result in the production of a larger quantity of turpentine and rosin.

I have here a statement prepared in the Bureau which I will read. It shows the result to the turpentine and rosin industry of the South for the season of 1902 if the method of orcharding advised by the Bureau had been employed:

TURPENTINE ORCHARDING.

Approximate output of spirits of turpentine and rosin for the season of 1902.

600,000 barrels of spirits of turpentine	$13,200,000
2,100,000 barrels of rosin	4,200,000
Total value of crop	17,400,000

Experiments conducted at Ocilla, Ga., show that if all the trees used in the production of the above amounts had been equipped with cups instead of having the "box" cut at the base of the tree there should have been produced from the same timber and the same labor—

1,050,000 barrels of spirits of turpentine	$23,100,000
3,675,000 barrels of rosin	7,350,000
Total value	30,450,000
Total loss of revenue	13,050,000

In addition to this is the increased value of the timber after turpentine operating is completed.

Large areas of pine forests hitherto not tapped are now made available by owners, provided the cup system is used. These parties offer to lease tracts on which they previously refused to have "box" tapping done.

Those facts have been absolutely proved. They have started what promises to be almost a revolution in methods of turpentine orcharding in the South.

The CHAIRMAN. How much further will you go in that line?

Mr. PRICE. We will continue with the method until we have established it. If we demonstrate the method beyond the shadow of a doubt it will result in the saving of many millions of dollars in the naval-stores industry.

The CHAIRMAN. That has been effected how—by the introduction of a new cup?

Mr. PRICE. By the introduction of a new cup and an improved system of tapping.

Representative SCOTT. Did you invent the cup, or did some private firm put it on the market?

Mr. PRICE. The system and cup were devised by a member of the Bureau, and their use has been demonstrated by him.

Representative HENRY. Has it been patented?

Mr. PRICE. He has applied for a patent for the system of tapping, but not for a patent for the cup.

The CHAIRMAN. Do the users of it pay royalty?

Mr. PRICE. They pay a royalty of 25 cents per thousand faces for the application of the system.

Representative SCOTT. Is it patented by the Bureau for the use of the people?

Mr. PRICE. It is patented by the man who invented it.

Representative GRAFF. For his own benefit?

Mr. PRICE. No, sir; but in order to insure the system against private control until it has been perfected.

Representative SCOTT. That is what I was getting at. I was trying to find out whether he was obtaining for his own use and benefit an invention that he had devised while on a salary by the United States.

Mr. PRICE. No. And if I said that the cup had been patented, I spoke under a misunderstanding of the question. It has not been patented. The system has, for the reason I have just stated.

Representative HASKINS. It would have to be patented in his own name and the Government would have the use of it under the law.

Mr. PRICE. Yes.

The CHAIRMAN. The Government would have no use for it.

Representative WILLIAMS. They have this use for it, that if they patent it nobody else can.

Mr. PRICE. The cup has not been patented because we are trying at present to have the cup used as widely as possible, and its use is for the general good.

The CHAIRMAN. What is it made of; tin?

Mr. PRICE. It is made of clay.

The CHAIRMAN. What is the make-up of the cup?

Mr. PRICE. You are no doubt familiar with the usual method of tapping which soon results in the death of the tree. Under our method the tapping is only a sort of surface scoring. It comes down in a V-shape to the cup. The danger of the old method was not only in a deep scoring of the surface of the tree, but in the deep cut that was made at the bottom in order to catch the drip. They generally cut 3 or 4 inches into the tree, and even after the resin had been collected there was more or less left in it, which made it a fire trap, and in case of a high wind it rendered the tree liable to be thrown.

The CHAIRMAN. It invited decay also?

Mr. PRICE. It invited decay also.

Representative WILLIAMS. You say you do not cut any farther than the sap?

Mr. PRICE. No; we merely score the face of the tree, which does it no permanent injury, and we indefinitely prolong the life of the turpentine industry.

Representative HENRY. It is akin to the tapping of maple trees in certain regions.

Mr. PRICE. Yes; in principle.

Representative HENRY. You can tap them for a hundred years without injury?

Mr. PRICE. Yes, sir.

The CHAIRMAN. Do you attach the cup to the bark?

Mr. PRICE. It is attached by a small nail driven into the trunk.

The CHAIRMAN. You say under the old method a tree was scored four times?

Mr. PRICE. A tree was scored first on one face in the first year's boxing, and then in the next year on the next side, then on the third side, and then on the fourth side.

The CHAIRMAN. Why was that necessary to be done?

Mr. PRICE. That was the method. That was as far as they had got in devising a system.

The CHAIRMAN. The scoring would heal over enough so that it would not run the following year?

Mr. PRICE. It would not run the following year and would have to be cut higher, and they got a better drip from the new face.

The CHAIRMAN. You do not do that now, do you?

Mr. PRICE. We avoid the deep cutting, and we put the cup at the bottom instead of making the box. Under our method a tree can be boxed indefinitely without causing death. Under the old method it was certain death to the tree.

Representative HENRY. How long since you introduced this method?

Mr. PRICE. It has been going on during the past year.

Representative HENRY. Just the past year?

Mr. PRICE. Just during the past year.

Representative HENRY. Are they willing to adopt it in the turpentine regions?

Mr. PRICE. It is being adopted rapidly. The reports have been so encouraging that I think its general adoption is sure.

Representative GRAFF. Who has been making these boxes? Who has been performing the work of making these boxes? How are the men engaged in the business purchasing them and from whom?

Mr. PRICE. The first experiment was made by Professor Herty, of the Bureau. He got the cooperation of a private owner of long-leaf pine land, who was willing to give his trees for the experiment. We give the experience of Dr. Herty, who supervised the experiment.

Representative GRAFF. Those who are getting the benefit of the experience are using these boxes, are they?

Mr. PRICE. They are using new cups they purchase themselves.

Representative GRAFF. Where are they purchasing them?

Mr. PRICE. I do not know the names of the firms that are manufacturing them.

Representative GRAFF. I want to have it clear whether the man who invented this cup is getting any benefit from it?

Mr. PRICE. He is getting absolutely no benefit from it. He is merely getting his salary from the Bureau.

Representative HASKINS. How long has it been used?

Mr. PRICE. Just during this past season.

The CHAIRMAN. Who is the man who invented it?

Mr. PRICE. Professor Herty, formerly professor of chemistry at the University of Georgia.

The CHAIRMAN. How old a man is he?

Mr. PRICE. He is a man 38 or 40 years old, I should say.

The CHAIRMAN. That seems to be a very distinct benefit you have conferred. There seems to be a tangible result from that.

Mr. PRICE. I think there is.

The CHAIRMAN. According to what you say yourself, it will only be a few years until the whole of the United States will be supplied with forestry men and experts?

Mr. PRICE. I think in a few years there will be enough to supply the demand.

The CHAIRMAN. As I said before, after we have taught this thing pretty freely, all the legitimate work the Government ought to do then is to take care of its own reserve.

Mr. PRICE. I think so; and then to study those questions which the private owner can not investigate fully.

The CHAIRMAN. If you build this Bureau up too fast and too big, beyond the needs of the public domain, there is great danger when that time arrives that it will be difficult to cut it down. You will never be able to cut it down again.

Mr. PRICE. Exactly, sir.

The CHAIRMAN. You will be handicapped with a whole lot of employees who have influence enough to be retained. That is the history of Government expenditures of this kind.

Mr. PRICE. But there are still important lines of investigation that we have not followed very far, and that fall naturally to the Government. For instance, we are asked to do the work in timber testing, which has only been just begun, and for which there is probably more insistent demand than there is for any other information we are asked to furnish.

Representative SCOTT. What do you mean by timber testing?

Mr. PRICE. I mean the test of the strength of commercial timbers.

Representative SCOTT. I thought that had been carried on ever since people have been using timbers to make bridges or to build ships.

Mr. PRICE. It has been carried on in a desultory way by private owners, but nothing authoritative has been done yet. There has been no work on timber testing by the Department of Agriculture except some that was done by the division of forestry for three years and then discontinued.

Representative SCOTT. Are there not numerous text-books on the strength of materials? Is it not a regular course in every scientific institution in the country?

Mr. PRICE. Yes; but there is no information yet extant which is full and thorough upon the comparative strength of American timber trees.

Representative SCOTT. Are not methods and machinery fully developed whereby anybody who has occasion to know the strength of timber can ascertain it?

Mr. PRICE. Not in my judgment. It is an expensive business. It requires a great many tests. It has been pretty well proved by experience that tests on small pieces are inadequate. The tests must be made on full-sized beams, and the machinery necessary to test 16-foot beams a foot square makes it an expensive matter and also a lengthy matter.

The CHAIRMAN. Where was that item in regard to railroad ties last year?

Mr. PRICE. That was in cooperation with the Bureau of Plant Industry. They were experimenting as to the durability of railroad ties under different treatments.

The CHAIRMAN. That would not come under forestry specifically, would it?

Mr. PRICE. Only in cooperation with the Bureau of Plant Industry, sir.

The CHAIRMAN. I remember we put the item in the Bureau of Plant Industry.

Mr. PRICE. Yes, sir; the work was carried on in cooperation with the railroads. They gave their willing and hearty support, and contributed very largely toward the work.

The CHAIRMAN. What subdivision of that Bureau is that in? I remember the item.

Mr. PRICE. I think pathology is the head, sir. Von Schrenk is the man.

The CHAIRMAN. Is it not in Vegetable Pathology?

Mr. PRICE. I think so, sir.

Representative CLAPP. Mr. Price, do you remember anything about a report that was published some time ago of the results of rather exhaustive inquiries which the Government carried on at the Watervliet Arsenal upon the strength of timbers?

Mr. PRICE. Timber-test reports; yes, sir. There were such experiments conducted, and their results were published in the Tenth Census, Volume IV. They made a good-sized report, but the tests were not made on full sized pieces, and they have not proved of great practical value.

The CHAIRMAN. Are there not now some experiments being conducted in St. Louis by a German there?

Mr. PRICE. Yes, sir; by Mr. Von Schrenk.

The CHAIRMAN. Who is aided in his investigations by the railroad?

Mr. PRICE. Herman Von Schrenk is the man, sir.

The CHAIRMAN. Is he also in the pay of the Department?

Mr. PRICE. He is under the pay of the Department. He is an employee of the Bureau of Plant Industry.

The CHAIRMAN. And also in the employ of the railroads?

Mr. PRICE. He is not in the employ of the railroads, sir. He is merely cooperating in work with the railroads. He is the representative——

The CHAIRMAN. Do you know what he is doing exactly?

Mr. PRICE. In my judgment he is doing some exceedingly useful work along lines of investigation of vital importance to the great railroad companies.

The CHAIRMAN. What is it, exactly?

Mr. PRICE. He is cooperating with the railroads along several different lines, among which is the durability of telegraph and telephone poles under different methods of treatment. Also the durability of railroad ties under different methods of treatment. He made a trip last year to consult authorities in Europe on that subject, which was paid for by the railroads. His work has received enthusiastic support from them. For instance, the Santa Fe Railroad has given him several miles of track, has offered to lay the ties for him, and also to give him a certain number of ties to treat in different ways. They are going to put them down in that southwestern section where ties rot very quickly, in order that he may get as rapid results as possible. The railroads consider his work is of enormous value.

The CHAIRMAN. What is his name?

Mr. PRICE. Herman Von Schrenk. His work covers an entirely new subject in this country.

The CHAIRMAN. The question of the strength of timber is an important one. There was another German out there who investigated the strength of different timbers.

Mr. PRICE. The only Government work I know of in that respect was conducted under Dr. Fernow, formerly chief of the Division of Forestry.

The CHAIRMAN. That was done at St. Louis, I think?

Mr. PRICE. That was done at St. Louis. It was done by Dr. Johnson, who has since died.

The CHAIRMAN. What became of that?

Mr. PRICE. It was discontinued.

The CHAIRMAN. Were there any practical results from it, or information from it?

Mr. PRICE. There were some bulletins published. The work has not been accepted as authoritative, however, and it was only the urgent demands we have been receiving for just that kind of work that makes us take it up again.

The CHAIRMAN. I do not see how you can get anything exact on that. It depends so much on the time the timber was cut, the condition of the tree, whether it was decayed or dead.

Mr. PRICE. We are going into it now on a very thorough basis after consulting the best engineers in this country. We are sending out a circular letter to all the engineers, asking their advice as to how the tests should be conducted. We have a thorough system of record of the pieces tested. We are not testing simply pieces such as used to be tested in the old experiments. We are testing full-sized pieces such as will be used and broken in actual service.

The CHAIRMAN. Where are you doing this?

Mr. PRICE. We are doing this in cooperation with the Bureau of Chemistry, in their laboratory. There is also a testing machine in operation at Yale University, in the use of which we are also cooperating, and we hope also to take up work in that line in cooperation with the University of California.

Representative SCOTT. Would the test of a piece of timber 16 feet long and 1 foot square furnish reliable data of the strength of a piece of timber 10 feet long and 4 inches square of the same variety?

Mr. PRICE. The results would not be valuable only for timbers of the size of the piece tested. They would be used in compiling figures showing the strength of that timber for different sizes.

Representative SCOTT. What I want to get at is whether, in order to have accurate results, you have to test the strength of the average different sized piece of timber you use?

Mr. PRICE. No, sir; but the larger the piece the more likely you are to average conditions. You might find a dozen different conditions in a piece 16 feet long and a foot square.

The CHAIRMAN. We know that a piece of timber four times as large as another would not be exactly four times as strong.

Mr. PRICE. Exactly.

Representative GRAFF. In other words, every part of the stick would be tested?

Mr. PRICE. Every part of the stick would be tested instead of one small sample of it.

Representative GRAFF. That is what you mean by the larger piece being the better test?

Mr. PRICE. Yes, sir; that is what I mean.

The CHAIRMAN. I do not know that there is anything further, Mr. Price.

The committee thereupon adjourned until Thursday morning, December 11, 1902, at 10.30 o'clock.

Subcommittee Committee on Agriculture,
House of Representatives,
Washington, D. C., December 11, 1902.

The subcommittee met at 10.30 o'clock a. m., Hon. J. W. Wadsworth in the chair.

STATEMENT OF MILTON WHITNEY, CHIEF OF THE BUREAU OF SOILS, DEPARTMENT OF AGRICULTURE.

The Chairman. Gentlemen, Mr. Whitney, Chief of the Bureau of Soils, is before us to-day. The item for that Bureau is on page 17 of the new copy of the estimates.

Mr. Whitney, the first change in your bill from last year is that you want two additional clerks at $1,600. What is the necessity of that, and is it transferred from the lump sum?

Mr. Whitney. Mr. Chairman, these two places are needed for two clerks that we now have on the lump fund that it has been necessary to employ since our last appropriation went into effect. One of those is a financial clerk, who represents the division of accounts, who has been detailed over to look after the work of the Bureau of Soils, and the other one is——

The Chairman. You mean to look over the accounts of the Bureau of Soils in the division of accounts?

Mr. Whitney. No.

The Chairman. Why does he work with you?

Mr. Whitney. He works with us so as to keep watch of all the financial operations of the Bureau.

The Chairman. I suppose if we gave you less money you would not need the clerk, would you?

Mr. Whitney. Very likely we could get along without the clerk. As it is now, of course, we have a good deal of work for a man to do, and the division of accounts can not handle it. This man gives all his time to it.

The Chairman. You mean it comes on account of complaint from Mr. Evan's office?

Mr. Whitney. Oh, no; not at all.

The Chairman. That he can not do the work?

Mr. Whitney. No; not at all. It is to keep a man in the Bureau of Soils who, at all times, has access to our books and to our plans of work, and who can keep the financial matters straight.

The Chairman. Who has been doing it up to this time?

Mr. Whitney. We have had that done by one of our ordinary clerks up to last year, but with the large operations under the bill now, there are so many field men out, so many accounts to keep, and so much semilegal work required—that is, the drafting of letters of instructions and construing of matters of accounts, as to how they can be passed and as to how certain expenditures can be incurred—that it really requires one man for each of these bureaus.

The Chairman. I say, who has been doing that work up to date?

Mr. Whitney. A Mr. Fagin.

The Chairman. It has had to be done, has it not?

Mr. Whitney. You mean up to this past year?

The Chairman. Who has been doing it up to the past year?

Mr. WHITNEY. I had my stenographer do it, but it became entirely too bulky for a clerk of that grade to handle. Not only too bulky, but too intricate. This arrangement has greatly facilitated the handling of the accounts. It has kept things moving very smoothly, and has expedited matters pertaining to the direction of the field work and to the auditing and passing of the accounts. The same arrangement holds good in the Bureau of Plant Industry. They have a clerk whom they pay for this work that pertains directly to that Bureau, a man who gives his entire time to that particular work.

The CHAIRMAN. I do not think there is any objection to that, but my point is, who is doing it now, and if it is being done by a clerk now, why submit estimates for an additional man to do it?

Mr. WHITNEY. In enlarging our organization we have to put that work off by itself and have one man—a really competent man—take charge of it.

The CHAIRMAN. This is not a new place exactly. You had a man doing this work.

Mr. WHITNEY. We had a man doing it. Yes, sir; it is simply a transfer.

The CHAIRMAN. What is he getting now—the man who does it?

Mr. WHITNEY. The man who does that now gets $1,400. We ask for $1,600.

The CHAIRMAN. It is in the nature of a promotion or increase in the statutory roll?

Mr. WHITNEY. Yes; it is in the nature of a promotion and increase of $200 over what he gets now.

The CHAIRMAN. What is the other provision?

Mr. WHITNEY. The other provision is for a man to take charge of the records of the office, to receive the maps when they are sent in from the fields. They are sent in every week or so as the work progresses. He has to receive these maps, examine them, and see that they are correct, so far as we can tell.

The CHAIRMAN. He can not tell anything about the correctness of them, can he?

Mr. WHITNEY. He can check them up, see that they fit, see that the roads join, and the soil boundaries join.

The CHAIRMAN. With maps previously received, you mean?

Mr. WHITNEY. Yes; with maps previously received. He keeps track of these maps as they come in, and he also keeps the record of the material sent out to the field men, and the supplies, and has general charge of the records connected with our field investigation. It requires a man of a good deal of ability, and it takes all the time of one capable man. I have asked for a $1,600 place. This man is also on the lump-fund roll at this time. He has been employed continually since the last estimate—since July—and we ask for a $1,600 place.

The CHAIRMAN. How much is he getting now?

Mr. WHITNEY. He is getting $1,400. I think both of these positions justify an able man, for whom we ought to pay $1,600.

Representative SCOTT. Were the men now engaged in doing this work formerly in the Department? Have you simply taken them from some other work?

Mr. WHITNEY. Mr. Fagin was in the Department some years ago, but was then transferred to the Post-Office Department, nd was brought back to take charge of this work.

Representative SCOTT. Where did you get the other man?

Mr. WHITNEY. The other man has for years been in the division of statistics. The man who has charge of our records was in the office of statistics and was transferred to this Bureau about the 1st of July.

Representative SCOTT. What were these men getting in the places they formerly held?

Mr. WHITNEY. I can not tell you that; I do not know. Mr. Fagin was in the Post-Office. I do not know what salary he was getting. Mr. Bauman, when he was in the division of statistics, I think was getting $1,600. He gave up that place and came to us at $1,400.

The CHAIRMAN. Why did he do that?

Mr. WHITNEY. Well, as a matter of preference.

The CHAIRMAN. Was it a matter of health or anything of that sort?

Mr. WHITNEY. No; not a matter of health at all. He thought there was a better future—a more interesting line of work with us. He seemed to wish to connect himself with this particular line of work.

The CHAIRMAN. He is not a scientist or anything of that kind, is he?

Mr. WHITNEY. No, sir; he is a clerk.

The CHAIRMAN. You have a fireman in the estimates, additional. What do you want him for?

Mr. WHITNEY. That is simply a transfer from the lump-fund roll to the statutory roll. He has been employed in the Department for six or seven years.

The CHAIRMAN. Mr. Whitney, in regard to transferring those firemen, we are undoubtedly going to have a new building. I think Congress will appropriate for a new building. He is employed in one of your outside buildings, is he not?

Mr. WHITNEY. Yes; he is. He is in my main building. That is an outside building.

The CHAIRMAN. It is not in the main office?

Mr. WHITNEY. No.

The CHAIRMAN. Of course, when the new building is erected all these offices will be transferred to it, and there will be a body of firemen to take care of the main furnace and heating plant, and each division will not need its own firemen as it does now, in separate rented houses. Why do you want to transfer him to the permanent roll?

Mr. WHITNEY. I suppose it will be four or five years before that building is erected.

The CHAIRMAN. Still if you get him on the permanent roll he will stay there four or five years from now?

Mr. WHITNEY. That is just as the committee wish. I simply state the exact facts.

The CHAIRMAN. I wanted to bring out the point whether you thought of that when you recommended his transfer.

Mr. WHITNEY. Unquestionably; but I saw no reason why that position should not be taken off, just as our rent would be taken off when we move into the new building.

The CHAIRMAN. If he is on the statutory roll you will have to take him off the statutory roll, then?

Mr. WHITNEY. Yes; we will just drop that position. He will be no longer required.

The CHAIRMAN. There are other firemen, I notice, on what is called the statutory roll.

Mr. WHITNEY. Oh, yes, sir; but he has been there for some years, and it is merely a transfer of this rather permanent place to the statutory fund.

The CHAIRMAN. Now, your charwomen. What do you want another one there for?

Mr. WHITNEY. We have one charwoman on the statutory roll and we have two large buildings to look after.

The CHAIRMAN. The same as last year?

Mr. WHITNEY. No, sir. Well, we had just moved into the other building then, when our last estimates were made. Mr. Woods, the pathologist, got out and we took the two buildings for our use. It has been impossible for one woman to look after both buildings, and we have been compelled to put another one on from our lump fund. This also is merely a transfer from the statutory to the lump fund.

The CHAIRMAN. I am inclined to think you had better leave this charwoman on the lump sum roll; but the committee will take that up and consider it.

Representative HENRY. Is the other one on the lump sum roll?

The CHAIRMAN. No; the other one is on the statutory roll. When the new building is completed, in two or three years, you understand, Mr. Henry, the charwomen and the firemen will then be provided for specifically.

Mr. WHITNEY. Yes. That, of course, is a question for the committee to decide. I present the facts as they are.

The CHAIRMAN. Now, in your general expenses of the Bureau of Soils there is the expression "Investigation of the relation of soils to climate and organic life at home and abroad." What do you want to do under that? Then you have "For investigations of soils in the United States and insular possessions." We struck that out last year, did we not?

Mr. WHITNEY. Yes; that was struck out last year.

The CHAIRMAN. We thought the work had better be done at home, at present?

Mr. WHITNEY. We have found it very necessary in one or two cases to send men abroad to acquire information as to the treatment of the soils that would be of use to our own people.

The CHAIRMAN. Can not that all be gotten by publication?

Mr. WHITNEY. No, sir.

The CHAIRMAN. Why not? Do not the governments abroad that are doing this work publish bulletins similar to ours?

Mr. WHITNEY. They are doing nothing to compare with the work we are doing in this country. A very good example of the necessity and value of this came up recently when the Bureau of Plant Industry sent a man to Algeria and Egypt to study the alkali-resistant plants. They requested us to send a soil man along to assist him in determining the salt content of soils where these plants were growing from which the seeds were obtained.

Representative WILLIAMS. Who was it sent that man?

Mr. WHITNEY. The Bureau of Plant Industry. So the Secretary detailed one of our soil men to accompany the pathologist, and incidentally we have acquired a vast amount of information concerning the alkali soils of Algeria and Egypt that will be of immense practical benefit to our people here. Mr. Means is in the room now. He has charge of this alkali reclamation work, and I should be pleased if, after I am through, you will hear him on it.

Representative COONEY. The foreign investigation was all for the purpose of applying the information to our home soils?

Mr. WHITNEY. Entirely, sir. They have had experience for hundreds of years in Egypt with these alkali soils. They have shown their ability to reclaim these soils in large areas on a commercial scale. He went there and spent three or four months studying their methods, and he is satisfied from his observations there and the knowledge of the conditions in this country that there is hardly an acre of alkali land in the West that can not be reclaimed.

Representative WILLIAMS. They reclaim those soils over there by washing them out, as they say?

Mr. WHITNEY. Yes.

Representative WILLIAMS. By washing the alkali out and by planting various legumes that have long roots and tubercles, berseem, and a whole lot of things. How do you apply the washing-out process to any of this dry, arid country? They have in Egypt the whole Nile River to do it with, you know.

Mr. WHITNEY. We will bring that up later; but just in passing I will say that we have reclaimed now an area near Salt Lake City. We have underdrained 40 acres of land and are underdraining an equal area at Fresno, Cal., where the land values have depreciated $1,000,000 in the last few years by the rise of alkali. The drains we have put in near Salt Lake City are carrying out a 2 per cent solution of salts day and night, all the time. It is the same method of underdrainage that is used in Illinois. It has simply not been applied to alkali soil. Just as soon as we have demonstrated to those people that we can reclaim those lands, there are 6,000,000 acres of land in the West that can and will be safely and economically reclaimed. It will cost the Department possibly $10,000 to demonstrate that to the people; but they will not take these lessons from our report. They will not take the advice. They have got to be shown that it can be done, just as it was in the Connecticut Valley with the tobacco.

Representative COONEY. Is that by a system of tileage?

Mr. WHITNEY. By a system of tileage; yes, sir.

Representative COONEY. Do you flood the basin above it, too?

Mr. WHITNEY. We just use the ordinary irrigation water.

The CHAIRMAN. You flood the land above.

Mr. WHITNEY. Yes; we flood the land.

The CHAIRMAN. And it goes through and washes out?

Mr. WHITNEY. It washes out.

Representative ALLEN. Is there not a generating element in the soil that reproduces the alkali?

Mr. WHITNEY. It would unless it was protected against further rise of alkali; but with this method of reclamation it is possible to reclaim the land and prevent a further rise of alkali.

Representative ALLEN. When it rises to the bottom of the tile it does not go any farther. It drains off.

Mr. WHITNEY. It drains off; yes. Not only that, Mr. Chairman, but it has been found in Egypt—and this is a very important thing for us to know—that they can free the soil of alkali below the drains by a system of intermittent filteration. That is, they give their land a period of rest. When the salts come up to the surface, then they wash them out again, and by repeating that they can get out more salt than is contained above the drain; so that their lands, even below the drains, are made better. There are various little details connected with the operation——

The CHAIRMAN. You say your man did go to Europe with the plant industry man?

Mr. WHITNEY. Yes, sir.

Representative HENRY. Is it possible to grow alfalfa on these reclaimed lands?

Mr. WHITNEY. Unquestionably.

Representative HENRY. I did not know but it rooted too deep.

Mr. WHITNEY. No, sir; it will grow very successfully.

Now, Mr. Chairman, another case came up where it was very desirable to send a man abroad from the Bureau of Soils to make a thorough examination of the tobacco soils of Cuba. We have evidence now, as I shall show later in my talk, of the possibility of producing a Cuban leaf in this country. There are soils in Texas that have produced a leaf that is pronounced by the New York experts as Cuban leaf. We have the right, under the bill, of sending a tobacco expert to Cuba. We sent two of our tobacco experts there and they examined these soils, and they say the soils are the same as these soils we have located in Texas upon which we have produced the Cuban leaf.

I should like very much to send a soil expert there to get all the information we possibly can as to the character of those Cuban soils and as to the conditions, so that we can use it in the prosecution of our work in Texas; but we are debarred from doing this by the wording of the present appropriation bill, that limits our work strictly to continental United States. It was for that reason that the Secretary put into the estimates the phrase "at home and abroad," that we should have the privilege, where it seemed wise, to send our soil experts abroad to get information that would be for the benefit of our own people.

Representative SCOTT. Professor, have you made any estimate of the amount of money you would use in these foreign examinations?

Mr. WHITNEY. Oh, it would be inconsiderable. There is no increase asked for for that at all. We can send them from the force of the Department. The Secretary could detach at any time a man from the soil survey and send him abroad at about the same expense that would be incurred in this country.

Representative SCOTT. It would be just his living expenses.

Mr. WHITNEY. Just his living expenses. It is simply a little wider latitude for us in the administration of the work of the Bureau.

The CHAIRMAN. Do you need to send another man abroad to Egypt again?

Mr. WHITNEY. No, sir.

The CHAIRMAN. You just want to send a man to Cuba, do you?

Mr. WHITNEY. We want now to send a man to Cuba. I would like to send a man the 1st of March. We are going to send another tobacco expert over there for about two weeks at harvesting time, so that he can become acquainted with the methods of harvesting and handling the tobacco. We think we are pretty well up on those matters here, but I do not want to let any opportunity pass, and the two or three hundred dollars that it would cost to send a man over there would be well invested, in view of the point we have reached in our Texas tobacco work.

Representative SCOTT. Mr. Chairman, I presume the point we want Professor Whitney particularly to speak to is what he proposes to do with the $65,000 additional?

Mr. Whitney, just go on in your own way and tell the committee, if you please, the need for this increase. I notice there is an item for telegraph and telephones and express charges. That is immaterial. Was not that in the last bill at all? Was not that provided for?

Mr. WHITNEY. I thought so before I noticed it was in here. The Secretary had it put in.

The CHAIRMAN. It is something connected with the Treasury Department. They want specific accounts.

Mr. WHITNEY. Yes; we are paying those bills and I suppose they want specific authorization.

The CHAIRMAN. Tell us in your own way the need for this increase you have asked for of $65,000.

Mr. WHITNEY. Mr. Chairman, I thought you might be interested in knowing something about the disposition of the force, and I might say that out of the 96 persons that we have on the rolls now 48 of them are employed in Washington in the office and laboratories, and 48 of them are in the field. It just happens to be equally divided that way.

The CHAIRMAN. Are they employed at the present moment?

Mr. WHITNEY. Yes, sir.

The CHAIRMAN. In the field?

Mr. WHITNEY. Yes, sir.

The CHAIRMAN. You do work in the South in the winter?

Mr. WHITNEY. Yes; this year I have been able to keep all of my field men out for the entire twelve months. It is the first time we have undertaken it, but we have massed them all now in the South, stretching from Florida across to California, and they are all going along with their field work just as they have done in the summer.

The CHAIRMAN. How many parties have you at work at this time in the South?

Mr. WHITNEY. We have had 15 parties out this year.

The CHAIRMAN. Fifteen at work now?

Mr. WHITNEY. They are all at work, but I have massed some of them. I have put 2 parties together in Alabama and 3 in the Colorado desert.

The CHAIRMAN. Southern Colorado?

Mr. WHITNEY. Yes, sir; and 2 in Texas, just as a matter of convenience.

The CHAIRMAN. Forty-eight of the men are now at work through the Southern States?

Mr. WHITNEY. Well, the 48 include my tobacco men. They are all out.

The CHAIRMAN. Are they in the field now?

Mr. WHITNEY. They are in the field: yes, sir.

The CHAIRMAN. In what part of the country are they at work?

Mr. WHITNEY. We have some in Connecticut, some in Ohio, and some in Texas. Just now their work is in the warehouses; that is, handling the crops that were grown last year.

Representative HENRY. And they are about finishing up for the year, are they not?

Mr. WHITNEY. They are about finishing up, but they are also preparing for next year's work.

The CHAIRMAN. Where will those men go when they get through with this warehouse work in the North? Of course, there is no planting or tenting now.

Mr. WHITNEY. The warehouse work in Connecticut, of course, will go well into the spring. There is $1,000,000 worth of tobacco there to be handled, and that will go well over into the spring.

The CHAIRMAN. What do your experts do in the warehouse work—what are they teaching?

Mr. WHITNEY. They are teaching the people how to handle tobacco. It is an entire change in every detail in the methods of handling tobacco in Connecticut. They are injecting themselves into these warehouses and giving instructions about the handling of this new product.

Representative HENRY. I might say that that work is absolutely indispensable. The system of curing shade-grown tobacco and the outdoor tobacco is entirely different. Our people are entirely unfamiliar with it. We have been experimenting for years and years to find some process of forcing the curing of tobacco, and it is only since the Department has taken hold of it——

The CHAIRMAN. How long do you expect that will have to be done? I mean how many years will you have to continue to teach that?

Mr. WHITNEY. No longer than this.

The CHAIRMAN. This is the last, is it?

Mr. WHITNEY. This is the last year. At most, we may leave one man there as an agent representing the Department. This year a million dollars' worth of tobacco has been grown under our direction—that is, on 700 acres of this tented tobacco. Next year it is estimated that twice that area will be planted and large investments are being made. Now, if the Connecticut people want one man left there, it may be it would be wise to keep one man. The man in charge of that work has already been ordered to report to Washington and one of the other men, or probably two of the party, will be sent to Texas some time before the 1st of March to strengthen that party. Then we have our Ohio party, and then we propose to take up work in North or South Carolina and in some other places, but I shall mention that when I come to the tobacco investigation.

Representative COONEY. When you mention these men being in warehouses, what warehouses do you refer to?

Mr. WHITNEY. The tobacco, after being harvested and cured in barns, is collected in a few central warehouses, where it can be handled on a large commercial scale.

The CHAIRMAN. Is that after it has been sold?

Mr. WHITNEY. No, sir; that is after it is dried; but it is for the purpose of fermentation.

The CHAIRMAN. It is in the original hands?

Mr. WHITNEY. It is in the original hands.

The CHAIRMAN. They are a sort of cooperative warehouse?

Mr. WHITNEY, Yes; very largely so.

Representative HENRY. The smaller growers are sending to the larger growers?

Mr. WHITNEY. Yes, sir. It costs about $8,000 to put up a warehouse. That is what Mr. Floyd paid. We are working in Floyd's warehouse and Whipple's warehouse, and he is receiving some of the smaller crops. Men who have grown two or three acres can not efficiently handle their own product.

Representative COONEY. When it is dried and put in the warehouse what is necessary to be done afterwards? What is this fermentation you speak of?

Mr. WHITNEY. After it is dried it is taken down from the barns while it is moist, hauled to the warehouse, put in great bulks of from five to ten thousand pounds, and allowed to go through a fermentation. It takes it about thirty or forty days. It has to be watched. The temperature rises, and at the proper time the bulk has to be torn down and built up again, and it is rebulked in this way several times.

Representative COONEY. In loose bulk?

Mr. WHITNEY. No, sir.

Representative COONEY. It is not put in hogsheads?

Mr. WHITNEY. No, sir; it is an open bulk. It is about 6 feet high and 6 feet across and as long as you want it. That process is one of the most difficult of all. It requires the utmost skill and it is an entire innovation on the methods in use.

Representative COONEY. It is a matter of temperature, then?

Mr. WHITNEY. Yes; temperature and moisture conditions; and it is the way it comes out of the sweat that largely determines the character of the leaf—that is, it affects the color, it affects the grain, it affects the flavor. They are all developed in the fermentation. After the fermentation it is baled and then is ready to be sold, but the farmers and not the dealers handle it through the fermentation.

Representative SCOTT. Professor, you had fifteen survey parties in the field this year, did you?

Mr. WHITNEY. Yes, sir.

Representative SCOTT. Were you able to meet practically all the calls made upon you?

Mr. WHITNEY. No, sir; we distributed the parties as well as we could, and we have done the work that seems to be the most important.

The CHAIRMAN. What will those men do when they come from Connecticut in the spring—your tobacco men? Will they be furloughed?

Mr. WHITNEY. No, sir. We need them all. They will be sent to Texas.

The CHAIRMAN. That is, after the 1st of January?

Mr. WHITNEY. After the 1st of January; yes. We will leave them there until they can be taken out without injury to the experiment.

The CHAIRMAN. How many men have you there in Connecticut now?

Mr. WHITNEY. We have, I think, six men.

Representative HENRY. Have you as many as that now?

Mr. WHITNEY. I think so; yes, sir.

Representative HENRY. McNess is there yet?

Mr. WHITNEY. McNess and Hinson, Stewart, Coby, and Weinburg.

The CHAIRMAN. How many warehouses are there?

Mr. WHITNEY. I do not know how many warehouses.

Representative HENRY. There are about half a dozen warehouses.

The CHAIRMAN. There is about a man to a warehouse?

Mr. WHITNEY. Yes, sir. Some of these, of course, Mr. Chairman, are our young men we are training.

Representative GRAFF. What salaries do these men mentioned receive, respectively, as well as you can remember?

Mr. WHITNEY. They receive $1,200.

Representative GRAFF. All six receive $1,200?

Mr. WHITNEY. McNess received more than that, but the others receive $1,200. They have been with us two years. One of the younger men I have just sent there gets $720.

Representative GRAFF. One of the six?

Mr. WHITNEY. One of the six; yes, sir.

Representative HAUGEN. They get something for expenses outside of that, I suppose?

Mr. WHITNEY. No, sir.

Representative HAUGEN. They pay their own expenses?

Mr. WHITNEY. They pay their own expenses.

The CHAIRMAN. Except traveling expenses.

Mr. WHITNEY. Except traveling expenses; yes, sir.

Mr. Chairman, in relation to the increases asked for for the next year, I have asked, or the Secretary has asked—of course I gave my estimates to him—for an increase of $36,000 for the soil-survey work. You will find this set forth in the appendix of the letter of the Secretary that is in the back part of the book, although I have tabulated it here, where you can see it a little more clearly.

Representative GRAFF. Professor, I do not want to interrupt you nor disturb the order of your talk.

Mr. WHITNEY. That is all right, sir.

Representative GRAFF. But it has struck me that after a soil survey has been made, if it is to be of practical value it ought to be within reach of practically every farmer in the area that has been surveyed; in other words, that the benefit of the survey and the subsequent investigations that are made here in the Bureau about the crops that are suited to the different soils that are outlined on the map ought to go to the farmers of that community, so that the information can be utilized by the farmers there. Now, I wanted to find out under the present management just about how many of these maps and publications could be available for the particular localities. For instance, if a county were surveyed which contains on an average of 30,000 or 40,000 people, and possibly of that number there might be 2,000 or 3,000 farmers—that would not, I think, be a large average——

The CHAIRMAN. There are more than that in an agricultural county.

Representative GRAFF. Yes; perhaps that is true. Have you thought of that subject, and does the present system of distribution and printing documents need any change?

Mr. WHITNEY. Yes; it does. I shall speak of that a little bit later, Mr. Graff, if you will allow me to defer it.

Representative GRAFF. All right.

Mr. WHITNEY. It is a very important subject, and one the Secretary has made a recommendation in regard to.

Representative GRAFF. There is no use of this information being gathered unless the people are going to get it.

Mr. WHITNEY. Unless you prefer that I should take it up now, I will defer that a little.

The CHAIRMAN. You had better take it up in your own way. These questions will give you suggestions as you go along.

Representative HAUGEN. Were you going to recur to the tobacco industry?

Mr. WHITNEY. Yes, sir. The first matter I will bring up now is the case of $36,000 for the soil survey. We have had fifteen parties out this season, and the Secretary asks that this increase of $36,000 be granted for nine additional parties, at about $4,000 a party. He asks for nine additional parties so that we can meet the demands that have been made on the Bureau, or attempt to meet them, because even that will not be sufficient to meet the demand. I told the Secretary when the estimates were being made up that to meet the present applications would require about thirty soil-survey parties. But these nine additional parties would make twenty-four, and he thought it would be better to make that recommendation; but in his report you will see that he gives a statement of the applications that were on file last August when the data was collected for him, and he says the applications at that time would require about thirty parties working in the field.

The CHAIRMAN. On a basis of thirty parties, how quickly do you propose to finish up the work?

Mr. WHITNEY. Mr. Chairman, I have never had any aspirations to survey the whole country. In the four years that we have been at work——

The CHAIRMAN. Of course these demands, you know, may come by the million. If you work on one man's farm, the next man will think "Why not work on mine?" He does not understand the real situation, probably, and he thinks his farm ought to be examined, too. Many of these demands, I take it, are based on just such a state of affairs, are they not?

Mr. WHITNEY. No, sir; they come from the Capitol, most of them, or are backed by Congressmen or Senators.

The CHAIRMAN. Then those who want these surveys ought to pay for them, if they have the money to do it.

Mr. WHITNEY. In the four years that the survey has been going along we have surveyed altogether 33,000 square miles. There is a map on the wall showing the areas that have been covered by the soil survey.

The CHAIRMAN. That was up to the first day of last July?

Mr. WHITNEY. No, sir; that is up to the first day of December, or really up to the last of December, because I have estimated what we will finish by then. That includes 33,623 square miles, or 21,518,000 acres, and that has been done for about $100,000.

Representative SCOTT. Professor, can you give us any idea of the area which you think has been developed by the surveys which have been made?

Mr. WHITNEY. I will speak of that as I speak of the work of the soil survey a little later. That will come out rather in the course of my remarks.

That, then, is the reason for this increase of $36,000. It is for 9 additional parties.

The CHAIRMAN. It is to do more work along the same lines you have been doing?

Mr. WHITNEY. It is to do more work; yes, sir.

Representative HENRY. You assume the average cost to be about $4,000 to a party?

Mr. WHITNEY. Four thousand dollars. We surveyed this year with 15 parties 15,752 square miles, or 11,361,000 acres. Now, we simply want to increase that a little. That is, by 9 parties. It would be about a 50 per cent increase.

Representative GRAFF. What is the average per acre on that estimate.

Mr. WHITNEY. It is about six-tenths of a cent an acre. It cost $3 a square mile for the preparation of the reports and everything. It makes about a sixth of a cent an acre. There were about 11,000,000 acres this last year.

The CHAIRMAN. And 10,000,000 before that. How much have you completed to date; twenty-one and a half millions?

Mr. WHITNEY. Yes, sir.

The CHAIRMAN. Go on, Mr. Whitney.

Mr. WHITNEY. They have been surveyed and the maps have been published; that is, except for this year's work, of course, which is now nearly ready for the printer. I have here a list of the areas we have surveyed this year, if any of you care to look at it.

Then, Mr. Chairman, we have asked for $15,000 for the tobacco investigation. We have had for two or three years an allotment of

$15,000, and have maintained 3 parties. We have worked in Connecticut and have built up an important industry there. We have worked in Ohio and have the prospect of important results there. We have worked in Texas, and we have there what is probably going to be the most important results that we have had at all; that is, the production of the Cuban type of filler.

Now, we have done a little work in Pennsylvania. They want more work done there. If we develop the industry in Texas so that we can produce a domestic Cuban leaf, it is going to necessarily cripple the older tobacco regions of the country, unless we can improve their crops. The Pennsylvania tobacco is selling to-day at 7 cents a pound. We are going to produce a tobacco in Texas that will sell for from 30 to 70 cents a pound; that will go into a 5-cent cigar, and which will compare favorably with the best Cuban cigars that are on our market.

Representative HENRY. You feel pretty certain of the quality, do you?

Mr. WHITNEY. I do.

Representative HENRY. How does it compare with the Cuban product?

Mr. WHITNEY. I have had that compared with 25-cent cigars—cigars that cost 25 cents in Cuba—and it belongs somewhere in that class of goods. There are 8,000,000,000 cigars made in this country annually. There are 100 cigars for every man, woman, and child in this country, and the output is increasing. It is a very important industry and contributes about $60,000,000 to the revenue of the country yearly.

The CHAIRMAN. You had how many tobacco parties at work last year?

Mr. WHITNEY. I had three, and we desire to maintain a party in Pennsylvania, in South Carolina, or in North Carolina, and then we have not yet touched the export types of Kentucky, Tennessee, Virginia, and North Carolina, nor have we done anything with the bright tobacco, an industry that is being almost wiped out. Where we formerly got 60 and 70 cents for the bright cigarette tobacco we are getting 7 and 8 cents a pound now, partly because of the low grade of the present leaf and partly because of the competition of the Turkish. A great deal of the cigarettes that are being sold as Turkish tobacco are made of our domestic leaf, but the demand for the Turkish tobacco is increasing very rapidly, and they are getting large prices for it, and our own supply and industry is threatened. Now, whether we can meet this situation or not I can not certainly say, but it is a question that I think our people would want to have taken up. In fact, they have asked earnestly that the Department look into this matter to see what is the trouble with the cigarette tobacco of the present day and whether we can introduce Turkish tobacco into this country to meet the demands of the smokers of to-day.

So we have asked for three additional tobacco parties, which the Secretary thinks can be well handled.

The CHAIRMAN. If I had my way I would almost stop the manufacture of cigarettes. We can not do it, of course, but it is ruining a great many young boys.

Representative ALLEN. Most of the States have laws to that effect. Mine has.

The CHAIRMAN. I know they have.

Mr. WHITNEY. That is, for minors.

Representative ALLEN. Of course, for minors.

The CHAIRMAN. But the college boys are all smoking cigarettes. It is extraordinary how that vice has crept in, because it is a vice.

Cigarette smoking grows and grows until a boy does not know the number he is smoking a day, nor the effect upon him.

Mr. WHITNEY. There is this to be said, however: If we are going to smoke cigarettes or cigars it is much less harmful to smoke good cigarettes and good cigars than to smoke poor ones—low-grade ones.

Representative WILLIAMS. Is that true? It seems to me your low-grade cigars are lacking in tobacco, and the more that is lacking in them the less harm they do. I was given a dozen cigars not long ago, and I could smoke two dozen of them without the slightest taste of tobacco, but I could detect the flavor of early Yorks, flatch Dutch, and all sorts of cabbages in them.

Mr. WHITNEY. If you take the average quality of Pennsylvania tobacco that is made up in these low-grade cigars you will find they are very strong. They do not satisfy one. They produce a craving. You can smoke and smoke and smoke, but they do not satisfy. You take a high-grade Cuban tobacco and smoke one cigar, and it satisfies you.

The CHAIRMAN. I suggest that we allow Mr. Whitney to proceed now as fast as he can, as we only have half an hour longer.

Mr. WHITNEY. Mr. Chairman, we have also asked for an allotment, or an amount sufficient for us to make an allotment of $6 000, for the reclamation work in our alkali land. This is a matter of the utmost importance. It seems to me it is a question that can quickly be finished. We need simply to demonstrate the entire feasibility of reclaiming these lands, and it will be taken up by commercial agencies, and the Department will be through with its work. I look for this to continue not exceeding three years, and possibly for one or two years. At the present time it is a matter of very great importance in the West, and it is a matter that the Department is prepared to handle. We can demonstrate to those people that these lands can be reclaimed, and the large areas that have been abandoned or that were originally unfit for cultivation can be brought under cultivation and land values be greatly enhanced.

The large area lying between Salt Lake City and the Great Salt Lake can be reclaimed. There have been hundreds of thousands of dollars wasted on that tract in trying to develop it, in trying to build up suburban residences, in trying to farm it. Canals have been built, railroads have been built, and people have been put on it to colonize it, invariably with disastrous results. The increase in the value of that land if it were reclaimed, taking out the cost of reclamation, would be about $3,000,000.

Representative GRAFF. How large an area is it?

Mr. WHITNEY. There are about 60,000 acres of land that can be reclaimed, and it will be worth at least $75 an acre and much of it will be worth $100 an acre, because that is the price of land around Salt Lake City. This area goes right up to the town.

Representative SCOTT. You go on private land to do your work?

Mr. WHITNEY. Yes; in our arrangement there. We found a gentleman who gave us the use of the land for three or five years, as we want. He bought the tile and we had it put in by our own men. We had it laid according to our own direction. We had control of the operations while he furnished the material and paid the freight and such things as that; and in that we are cooperating with the Utah experiment station. They are going to crop the land and we are simply watching the development in the soil itself, keeping track of the amount of salt that comes out of it, simply to give to the people an authoritative statement as to the changes that take place in the land. It costs us $300 in addition to the salaries of our men.

Representative HAUGEN. What do you estimate to be the cost of reclaiming an acre?

Mr. WHITNEY. From $15 to $20.

Representative HAUGEN. Is it done by tiling, mostly?

Mr. WHITNEY. It is done by tiling; yes, sir. Then, as a portion of the increase asked for, we want to make an allotment of $5,000 for the general office expenses here in Washington. That is for supplies, instruments, and clerical hire which may be necessary, or such work as may be necessary here in Washington in providing for the increased work. We also want to make an allotment of $3,000 for laboratories for the work they are doing in connection with our field work. That is $8,000 for the Washington office and the remainder of the $65,000 to be expended in the field.

The CHAIRMAN. Eight thousand dollars in the office and the balance of the $65,000 in the field?

Mr. WHITNEY. Yes, sir.

The CHAIRMAN. Fifty-seven thousand dollars in the field?

Mr. WHITNEY. Yes, sir.

The CHAIRMAN. We will take up these detailed statements which the Professor has prepared and consider them when we consider the bill.

Representative WILLIAMS. That makes the Washington expenses about one-seventh of the total increase. As this work progresses will it require one-seventh of it to keep up the work of the clerical force and the work here?

Mr. WHITNEY. It is the laboratories and materials sent in.

Representative WILLIAMS. It is the instruments, etc.?

Mr. WHITNEY. Yes, sir.

Representative WILLIAMS. It seems to me that is a great proportion, if there has to be $1 spent here for every $7 put in the field.

Mr. WHITNEY. Mr. Williams, we only have five clerks.

Representative WILLIAMS. The proportion is greater than that now, but it seems to me the office work in the future ought not to increase the proportion one-seventh.

Mr. WHITNEY. Not the clerical work, but the analysis of the soils.

Representative WILLIAMS. I understand; that is done by office work here.

Mr. WHITNEY. Well, by laboratories; yes.

Representative WILLIAMS. What you have to do here is analyze the soils, put your specimens up, and publish your results?

Mr. WHITNEY. And drawing our maps.

Representative WILLIAMS. That is what I say. Publish your results, which of course includes your maps, as a part of it. Then you have to have the instruments that do the analyzing, and things of that sort. That is about all.

Mr. WHITNEY. Well, it is a question of judgment.

Representative WILLIAMS. We will eventually have to survey the soil of the entire United States. This thing goes into one Congressman's district, and then another wants it. It will go all through, because they will insist on it, like seed, after a while. If we have to have $1 for the expenses here to every $7 we spend outdoors, we are going to have an awful thing here before we get through.

Mr. WHITNEY. Mr. Williams, we spend now $26,000 for our office. That is what it costs us, including the rent; and we want to spend $31,000.

Representative WILLIAMS. What is your total expenditure now?

Mr. WHITNEY. The total expenditure is $169,000.

Representative GRAFF. What is charged to your office force? Are these people who go into the field and who are partly in the field and partly at home charged to that?

Mr. WHITNEY. No; they are all out in the field. Here is the statement of our clerical work in Washington, if you care to see that. I do not know that you care for that.

The CHAIRMAN. Yes; I would like to have that, too.

Representative COONEY. Professor, I would like to ask you, just for my own information, what is the good and the purpose of these soil surveys you are making?

Mr. WHITNEY. If we have time I shall cover that in going over the results of the soil surveys later. Mr. Chairman, you say you only have twenty minutes?

The CHAIRMAN. We have about twenty-five minutes yet, and maybe a little longer. Let us go along as fast as we can and understand the situation.

Mr. WHITNEY. Are there any other questions you wish to ask about the increase asked for?

The CHAIRMAN. No; I think you have explained how you want to use that increase. That is what the committee wanted principally. In this list of clerks employed in the office here you say there are five routine clerks. What do you call routine clerks?

Mr. WHITNEY. Copyists. They copy reports that are sent in from the field men.

The CHAIRMAN. Two of them are on the statutory roll and three on the lump sum?

Mr. WHITNEY. Yes.

The CHAIRMAN. What salary do they get, those three, on the lump sum?

Mr. WHITNEY. They get $720.

The CHAIRMAN. Then they are classed as laborers here, are they?

Mr. WHITNEY. Yes, sir.

The CHAIRMAN. Have you a copy of our bill before you? They are classed as laborers, really?

Mr. WHITNEY. Yes; they have been in for a number of years, and they are in that indeterminate class——

The CHAIRMAN. Eight assistants at $600 each, in your lump sum. What are they?

Mr. WHITNEY. They are in the laboratories. They are young men, student aids. They are in the classified service as scientific aids.

The CHAIRMAN. One laborer at $240. Is that by the year?

Mr. WHITNEY. Yes; that is a charwoman. She is employed part of the day.

The CHAIRMAN. I notice in your lump-sum roll one physicist at $2,500.

Mr. WHITNEY. Yes; that is the man in charge of the laboratory of soil physics. That has to do with the physical problems of the soil. He makes the mechanical analyses of the field samples and handles the general physical problems connected with the field investigations.

The CHAIRMAN. The other men on the statutory roll, called scientists, they are physicists too, are they not, some of them?

Mr. WHITNEY. No, sir; some of them I have in the laboratory and some in the field. We use those statutory people as well as we can. Some of them are in Washington, some of them are outside.

The CHAIRMAN. With regard to transferring that physicist to the statutory roll, is that temporary employment?

Mr. WHITNEY. No; not exactly, except that positions of that kind are filled by men that we have to train ourselves. He has been in the Department for about seven years. He came in, I think, at $1,400.

The CHAIRMAN. How long has he been there, do you say?

Mr. WHITNEY. About seven years, and he has developed to the charge of the physical laboratory. If I should lose him, if he should be taken away by any of the colleges, I would not be able to find a man in the country who is worth $2,500. I do not know where I would get him, and I have not a man in the laboratory that could take his place without jumping him in salary. I think the next highest salary we pay in the laboratory is $1,800, and I do not think he is a man that I would want to put in this place; so that if that is a statutory place and we should lose this man to-morrow we would have to put some one in who is not quite ready for it.

The CHAIRMAN. You would have to put him at a lower salary?

Mr. WHITNEY. I would want to put him at a lower salary. I have one place at $2,500.

The CHAIRMAN. That is on the statutory roll?

Mr. WHITNEY. That is on the statutory; yes, sir; but I did not want to have two places, because I was afraid I would be embarrassed.

The CHAIRMAN. Is it a question of rank?

Mr. WHITNEY. No, sir; not a question of rank, but I mean I would be embarrassed if I lost a $2,500 man. We have had to train all our men. We have trained all the men we have in the Bureau. We take them in as young men and train them. If they go, there is no one else to take their place.

Representative HENRY. And you do not want to promote the lower grade men to the salary of the present incumbent?

Mr. WHITNEY. I do not want to promote him to the salary that the present one has.

The CHAIRMAN. So you prefer to have that left on the lump-sum roll?

Mr. WHITNEY. Yes, sir; I think so. In my judgment, it would be wiser. It is a good deal like our tobacco men. We take these young men, and they are not known outside, and we keep them for two or three years. They get used to our methods and then they have offers outside with salaries of far more than we can give. Mr. Floyd has left the Department in the past year—last February. He gets $5,000 and an interest in the work; that gives him between $12,000 and $15,000 a year.

Representative HENRY. He gets a bonus for ten, twelve, or fifteen years in the way of stock?

Mr. WHITNEY. That bears interest; yes. Mr. McNess, our tobacco expert, who took his place, was recently offered a similar position, and he declined it. He was getting $1,800 with us.

The CHAIRMAN. That is all in the educational line. It is legitimate and proper. He is going out and is able to do the work now which the Government is paying to have done.

Mr. WHITNEY. Yes; that is all right. He declined it for this reason, that our work in Texas is so important that he wanted to stay with the Department until we had gotten through with that; then he would be an abler man, he would be a broader man. In another year we will expect to lose Mr. McNess and also to lose some of our other men. In the meantime, Mr. Chairman, while we are educating these men we have to carry them along to give them some encouragement. Some of our young men in Connecticut who are getting $1,000 have had offers of $2,000 outside.

The CHAIRMAN. How much does McNess get now?

Mr. WHITNEY. He gets $3,000.

The CHAIRMAN. Is he on your statutory roll?

Mr. WHITNEY. No, sir; on the lump fund.

The CHAIRMAN. He is not mentioned in the note giving the list of persons paid from appropriations "Soil investigations, 1903?"

Mr. WHITNEY. He is not in Washington, you know. He is outside. This only refers to the employees at Washington, as I understand it.

The CHAIRMAN. He gets $3,000, does he?

Mr. WHITNEY. He was getting $1,800 until this offer came to him from some New York capitalist, and he declined it voluntarily. He said he wanted to remain with us for another year at least until he could finish his education. The Secretary said: "Now, to show our appreciation of what he has done and our appreciation of his value to us as he is developing this work, we will give him $3,000," and so he was given $3,000 for that last year.

The CHAIRMAN. What was he offered by the New York company, do you know?

Mr. WHITNEY. He was offered $5,000 and an interest that would amount to between $12,000 and $15,000.

The CHAIRMAN. He ought to have taken it.

Mr. WHITNEY. He is a very efficient man.

The CHAIRMAN. You will find that some young fellow will take his place. There is no hole that can not be filled in this world.

Mr. WHITNEY. No; I have them coming on, but it takes time. I do not want to be embarrassed by losing too many at once. There is a matter that Mr. Graff referred to about the printing and distribution of this report of the field operations. It is at present published under joint resolution of February 23, 1901, by which each Congressman has about fifteen copies and each Senator has about thirty copies. The Department has 8,000 and the House and Senate together have 9,000 copies.

Representative GRAFF. That would be of the entire year's work?

Mr. WHITNEY. Of the entire year's work.

Representative GRAFF. With the maps?

Mr. WHITNEY. Yes. Furthermore, the Public Printer interprets the resolution to mean that it shall be published in one volume, but it makes a bulky and expensive volume for general distribution. The Secretary recommends in his report that this joint resolution be amended so that this material can be published as the work is finished. As it is now, we finish some of our work in January and it has to be held in my office until the following February, when the work of the current year is all completed.

Representative ALLEN. You mean the succeeding February a year?

Mr. WHITNEY. The next year; yes. Then it is all given out to the lithographer, and it makes a great mass of work. There are only two lithographers in the country that can handle it. There is one in New York and one in Baltimore. They are the only firms that do this kind of work at all, and it creates a congestion when it is all presented at one time. It is the following October when the reports appear. That is eighteen months after the work has been finished.

The Secretary suggests that the joint resolution be so amended as to permit these reports being published as the work is ready, either in parts—that is, grouping certain portions of the country, such as the Middle West or the Southern States, and providing also that reprints of these reports shall be furnished for immediate distribution, 2,000 copies of the reprint being furnished to each Representative in whose district the survey is made and 500 copies for each Senator from the State, and 1,000 copies for the use of the Department.' These can be printed at once and sent out immediately upon the completion of the work.

Representative WILLIAMS. Are those bound volumes or just sheets?

Mr. WHITNEY. They are in sheets, in unbound volumes, with the map. Then this more permanent edition can be printed, of which each Congressman has 15 copies and each Senator about 30.

The CHAIRMAN. He does not recommend that it be issued in parts?

Mr. WHITNEY. In parts; yes, sir.

The CHAIRMAN. The trouble with that will be that one man will be supplied with a part and no other part.

Mr. WHITNEY. No; they will all have the complete work, but if a survey is made in your district, as soon as the work is done it can be sent to the printer and he will issue these preliminary sheets.

The CHAIRMAN. Unbound?

Mr. WHITNEY. Unbound; just advance sheets for immediate distribution.

Representative GRAFF. Tacked together, I suppose?

Mr. WHITNEY. Tacked together; and you would get 2,000 copies for distribution.

Representative GRAFF. In that form?

Mr. WHITNEY. Yes, sir.

Representative ALLEN. It will keep the local interest alive?

Mr. WHITNEY. It will keep the local interest alive, and they will cost about 5 cents apiece.

The CHAIRMAN. That is done through the Printing Committee?

Mr. WHITNEY. I do not know about that.

The CHAIRMAN. Yes; that is done through the Printing Committee.

Representative GRAFF. Do you not think that is a good idea, Mr. Chairman?

The CHAIRMAN. Yes; in that way we would get complete data of the year's work. You remember that occurred in the War of the Rebellion Record. There are any number of broken sets of that all over the country. A member of Congress would send one volume to a man and the next volume to another man, and another volume to another man; and there are broken sets all over the country, incomplete, absolutely of no account.

Representative GRAFF. But this proposition, as I understand it, of these separate sheets of the work done, for instance, in a State involving maybe two or three different counties, in advance of the complete publication of the soil work, would be simply supplementary to the annual publication, and the annual publication would come out as it does now.

The CHAIRMAN. And would cover the whole field; yes.

Mr. WHITNEY. This would be just advance sheets from the annual volume, just as it is published now.

Representative GRAFF. A man in California receiving 15 volumes would not have a sufficient number if he had had a survey, and if he had not had a survey it would not be of any interest to him at all, and in the meantime the member of Congress representing the area or areas which have been surveyed would not have anything available that would be sufficient to give the information to the people

Representative WILLIAMS. I had a matter come up in my own experience. I wrote to two Senators who had no interest in the matter particularly, and asked them to give me their set, and we could swap around, so as to get as many volumes as possible for the people interested in the work.

Representative GRAFF. But you do not get those volumes now for about eighteen months afterwards.

Representative ALLEN. Before I left to come here, I was asked by a dozen men what had become of the soil survey. They said they had heard nothing from it. They seemed interested and wanted to know about it. If these publications were sent to them, it would keep them in line and keep up the interest.

Mr. WHITNEY. They will not get it now until next October.

The CHAIRMAN. That is about the way with the agricultural report. How much behind are we with the Agricultural Yearbook, Mr. Gibson?

The CLERK. The Yearbook for 1901 is the latest we have.

The CHAIRMAN. It is six months behind, at least. Go ahead, Mr. Whitney.

Mr. WHITNEY. This recommendation in regard to the publication and distribution of these reports is in the Secretary's report. I have presented it just as he presented it. Mr. Chairman, I think I have covered all the main points of the work. I am prepared, if any of the gentlemen want to hear it, to state some of the results of the work this year.

The CHAIRMAN. We would like to hear that.

Representative SCOTT. We only have a minute, Mr. Chairman.

The CHAIRMAN. The committee will take a recess now until 2 o'clock, and then we will go on with Mr. Whitney.

The committee (at 12 o'clock m.) took a recess until 2 o'clock p. m.

AFTER RECESS.

The committee reassembled at the expiration of the recess, Hon. J. W. Wadsworth in the chair.

STATEMENT OF MILTON WHITNEY—Resumed.

The CHAIRMAN. Professor, you may go on with your statement. Take it up in your own manner.

Mr. WHITNEY. Mr. Scott was just speaking of that matter of publication, and it seems if we had advance sheets of this report of field operations, if they could be issued in those quantities, that would be what we would want.

Representative GRAFF. Yes; instead of bound copies.

Mr. WHITNEY. The bound copies would come later.

Representative GRAFF. These advance sheets, though, would come to us in sufficient numbers so that we could send them out to the farmers?

Mr. WHITNEY. Yes; 2,000 to each Representative.

Representative COONEY. In what shape do they come?

Representative GRAFF. They would probably be tacked together.

Mr. WHITNEY. Just exactly like that [indicating].

The CHAIRMAN. Like a farmer's bulletin?

Mr. WHITNEY. Yes.

Representative SCOTT. Mr. Whitney, you do not mean to say 2,000 for each Representative?

Mr. WHITNEY. For the Representative from the district in which the work is done.

Representative GRAFF. It seems to me that is one of the fatal defects about the whole field investigation in the Agricultural Department. We are not getting the results of the scientific investigations to the people.

The CHAIRMAN. In most cases that is the fault of the people.

Representative GRAFF. Yes; I think so.

The CHAIRMAN. I think the information is accessible if they only want it, but they do not reach after it.

Representative GRAFF. In the first place, until a man commences to do that he does not take much interest in it. You will find occasionally a farmer who keeps writing to us until we learn his handwriting. He is in the habit, because he has started at it, of getting information at the Bureau; but the greater number of them say there is nobody knows more about their farms than he does. A man will say, "My father farmed thus," or, "I have been farming here ten years. There is nothing in these new gimcrack notions," and they are prejudiced against any innovations or against anything that is of value.

Representative HAUGEN. It would be impossible, though, to furnish them with this information if each member only gets 16 copies.

Representative COONEY. When you commence to send out these sheets, though, you are going to make a terrible pressure on the Bureau for this work.

Representative GRAFF. This does not involve much.

Mr. WHITNEY. This is to relieve the pressure.

Representative HAUGEN. I would suggest that we place a limited number of copies at the disposal of the Secretary, so that the districts may be furnished with a sufficient number at the request of the committee.

The CHAIRMAN. This matter is discussed informally here, but it is really a matter for the Printing Committee.

Mr. WHITNEY. Mr. Chairman, this morning I took up the main features of the administrative part of the work, and unless there are further questions to be answered I will go on and inform the committee of some of the results of the soil survey, as I think they might be interesting.

The CHAIRMAN. Yes.

Mr. WHITNEY. I have already spoken of the number of parties we have had out, and of the length of the season; that is, we have made arrangements this year to keep all the parties out throughout the twelve months. Of course it is a good deal of a strain on the men, and it is likely we will have to have them in for three months to get in touch with the work of the home office. However, they have all been kept out this year, and we are covering a very large area.

One reason for the increased allotment necessary for the office force, which I neglected to say this morning, in relation to what Mr. Williams said, was the fact that we used to have our field men in during the winter. During the cold weather they were brought in and did a portion of the literary work in getting the reports in shape, which, by reason of our keeping them out now, we have to assume entirely here in the city. Still, I think the plan of keeping them out as long as possible is a very desirable one.

Mr. Cooney asked me this morning about the value of these maps and surveys, and what they are to be used for, and about the value of the whole survey. I was very much impressed in a recent visit to Texas, where we are having a survey made in the Vernon area, in Wilbarger County, in the Panhandle. When I went down, some of the gentlemen said what they wanted there was a forage crop. The wheat crop is uncertain, cotton is uncertain, and the stock interests must be paramount, and the ranges were giving out. I told them that from the forage point the work should come under another division of the Department, but from a soil standpoint I would look into the matter. When I got to Vernon and went over the area I found quite a variety of soils. There were sandy loams, sandy soils, loam soils, and clay soils. They seemed to have a variety there, adapted to almost any kind of plant that the locality would grow. Then I looked into the other questions that would affect the introduction of crops, particularly in that climate. I found that in the Panhandle they have 20 inches of rainfall annually. (We have about 40 inches here in Washington.) Half of that falls in the winter and half in the summer. In California they grow good crops of wheat with 20 inches of rain. There the 20 inches of rain come in the winter.

The CHAIRMAN. It comes at the right time, in other words?

Mr. WHITNEY. It comes at the right time and soaks their soils. The wheat is planted after the rains and the soils are sufficiently retentive of moisture to retain conditions for growth until the wheat is ripe. Then they have their dry season. In the Vernon area the rainfall comes in the summer. It begins in June, and from June on for six months they have the same amount of rain per month that we do in Washington, but at the point when their grain is growing in the early spring is just the time of their annual dry season. The problem is to get a forage crop, or to get any kind of a crop adapted to an early drought. There are lots of crops that will stand a drought late in the season, but it is a very difficult matter to get a plant that will stand a drought in the early growing season before it gets a start.

Now, the results of the survey, showing the character of the soils in the Vernon area (as a representative area in the Panhandle of Texas), give us a basis for the introduction of this macaroni wheat, which is supposed to stand dry conditions, and it also gives us a basis for the introduction of forage crops, provided in looking over the list of forage plants we can find crops like our Bermuda grass and our crab grass that come up in June and that have their period of growth during the late summer. So that the soil survey has opened up the subject, has presented the problem that the agrostologist of the Department will need to work upon, and find crops that will meet the conditions that are presented as the result of the soil survey.

We have also had some interesting experiences in the rice lands of Texas and Louisiana. The introduction of the kushia rice——

Representative HENRY. Where does that originate, Professor?

Mr. WHITNEY. It is a Japanese rice, introduced by Dr. Knapp, of the Department. The spread of kushia rice has simply opened up the country there and has set the people almost wild. The industrial agent of the Southern Pacific Railroad told me last month that during the past year he had sold for the road 900,000 acres of rice land.

Representative SCOTT. Had the Bureau of Soils anything to do with developing that industry?

Mr. WHITNEY. No; the Department had, but I come to our place in it now. Of course the rice country extends from Louisiana, from the Mississippi River, all the way around to the southern part of Texas. It has been found, however, that there is a variety of soil——

The CHAIRMAN. Is this the rice portion down here, Professor [indicating]?

Mr. WHITNEY. No; it is right around the Gulf from Louisiana.

Representative HENRY. How wide a strip?

Mr. WHITNEY. It is about 50 miles wide.

Representative HENRY. Extending through the whole seacoast of Texas?

Mr. WHITNEY. Yes; it is almost a quarter of a circle.

Representative HENRY. And extending into Louisiana?

Mr. WHITNEY. Extending into Louisiana. We made one survey in southern Louisiana last year and one in Texas this year.

It has been the experience in the development of this rice industry that the different soils yield very different quantities and qualities of rice. Dr. Knapp reported to me, when he urged us to take up this work, that some of those lands gave a yield normally of 8 barrels of rice to the acre, some of them of 15 and some of them of 20.

The problem is for those people to find out the lands that give the large yield and the fine quality of rice, because the quality of the rice has much to do with the value of the rice after it is grown; and it has been found that we can map these soils and throw them into classes, some of them well adapted to rice and those that are not so well adapted that give smaller yields. It has seemed to the Department and the people of the South that a continuation of this work down there, a following out of the good rice soils in that alluvial country, would be a matter of great value to the people in giving them a safe basis for the development of this extensive industry that they are taking up. It is just at the time that the industry is starting. It has just got a foothold now and it is extending rapidly.

We have a problem also in the fruit district of Virginia, which we have developed more extensively this year along these same lines; and while I speak of the importance of the soil work I do not want it to appear at all that I am arguing that we have the whole thing. It is simply contributing to the success of agricultural development. Part of it is our work and part of it belongs to the other work of the Department of Agriculture. There is necessarily some overlapping, and we have to cooperate.

We have surveyed about 1,500 square miles in the heart of the Blue Ridge Mountains in Virginia, in the Albemarle section, extending from the Piedmont plateau on the east of the mountains, including the mountains, and going over into the Valley of Virginia at Harrisonburg. I have recently been down there and have gone over the area with the man who has been in charge of this work for two years. He has spent eighteen months in the area and has seen practically every foot of the land. He has mapped the soils of the mountains, of the plateau, and of the valley. He has lived with the people, has talked with them of their experiences, of their successes, and of their failures, and has seen the results in two crops that have been harvested from the lands. It appears evident to him and to me that the most conservative success, the greatest possibilities of commercial success, are in the development of this industry along certain lines.

We have in the first place the Albemarle pippin, which is one of the famous apples of the day. That is unquestionably best suited to what we call the porter's black loam. This is the Bedford area [pointing to a map]. The Albemarle section has not been finished. It is an instructive thing to see this. There are three main varieties of apples being grown in the mountains of Virginia, representing an industry that is going to be of enormous proportions. They are going into it on a commercial scale, and they are producing a very fine grade of apples. The three chief varieties are the Albemarle pippin, the Winesaps, and the York Imperials. The Albemarle pippin does best on the porter black loam, represented by this color [indicating]. You see there is very little of it on this map. It does not extend down to this part of the mountain, but it extends from here up [indicating], and is also met again in western North Carolina, where this industry has also been developed. The apple does best at an elevation of about 1,500 feet, up on the sides of the mountain, but in the coves, where the trees are protected from the storms; and the quality is not so good at a higher elevation or at a lower elevation. About 1,500 feet is the best position, although the apples will grow higher or lower. It is in these little coves, where the soil runs up the sides of the mountain, where the soil is deep and the trees are sheltered from the weather. That is the very finest location for the Albemarle pippin. The trees will grow on the sides of the mountains or on top, in a situation like that [indicating], but they are not so productive. The crops are not so sure. You understand, an orchard requires seven years to come to commercial bearing, and it is a costly mistake where it is found too late that they have been planted on the wrong soils or in the wrong situation.

The Winesap, on the other hand, does better on the potter's red clay, represented by this color [indicating]. This is typically a Winesap soil, and you get better results and, what is more important still, you get surer results, surer crops, more frequent crops, on this soil than where they are planted on the Albemarle pippin soil. The York Imperials, although they do well on both of those soils, do still better on the valley soil derived from the limestone rock.

Now, while all of these apples do well on most of these soils, when it comes to a competition the man who gets a crop every other year is going to be better off than a man who gets a crop every third year, and that is one of the important differences in these soils and their relation to apples. I have seen an orchard on this red clay that is noted for one crop that it has produced; but in five years it has never produced another.

The Albemarle pippin, grown in these coves on the potter's black loam, gives a sure crop every other year, while qualities grown on other soils may give a crop every third year, and when it comes down to a question of commercial value the soil, the elevation, and the location must all be taken into account. It seems, as the result of our two years' work, that we can point out the lines along which the apple industry can safely and conservatively be developed.

Representative Scott. When you say that the Albemarle pippin produces a crop in this black loam every other year, do you mean that to be taken literally, that it never produces a crop two years in succession?

Mr. Whitney. No; they do not expect an apple crop there every year.

Representative Scott. What is the reason for that?

Mr. WHITNEY. It is not known at all.

Representative SCOTT. Let me ask this question. Suppose you plant an orchard this year and another orchard next year; then when they come into bearing, will those orchards alternate?

Mr. WHITNEY. No; they usually come together. They both have a good crop every other year no matter what year the orchard was planted in.

Representative COONEY. It depends on the atmosphere and conditions?

Representative SCOTT. If it depended on the atmosphere and conditions, it looks to me as if there might come two years in succession when the atmosphere and conditions would be favorable for a crop.

Mr. WHITNEY. I do not mean to say that every other year there is a failure, but every other year as a rule there is a large crop and a small crop.

Representative HENRY. Do I understand they are growing the varieties of apples for commercial purposes at the present time?

Mr. WHITNEY. Yes.

Representative HENRY. Are the transportation facilities so they can do it?

Mr. WHITNEY. They have difficulty about that. This is right up in the mountains. These lands are being bought away up on the mountains, where they have to haul 10 or 15 miles to the markets; and, furthermore, they have to store these apples in cold storage to get their highest value. The warm spell, such as we had this year, takes off about a fifth of the value. They do not keep, and so they send them to Richmond, or they send them North, and the Secretary now is investigating the possibility of having cold-storage houses right at the fields.

But that is one of the things, it seems to me, where the Department can help the farmer; that is, to determine the conservative course which they should follow, which we can do in a couple of seasons, rather than to wait for the costly experience of the farmers who have to wait in the first place seven years for the orchard to come into commercial bearing.

The CHAIRMAN. Did you ever consider, in connection with that point, Professor, the present price of apples, i. e., the price farmers are getting for apples now?

Mr. WHITNEY. Well, they get pretty good prices.

The CHAIRMAN. They do? For that variety?

Mr. WHITNEY. Yes. As I say, of course we come in contact with the other work of the Department. The Division of Pomology has this work of the fruit trees, but at the same time we are contributing this information to them as a basis for their work. They have had an agent down there this year working with us, but we are collecting this information in regard to the soils, the location, and the elevation and such things as we can, as indicating the relative value of the soils.

We have also this year gone into the heart of the Allegheny Mountains, in the Mount Mitchell area, just north of Asheville, N. C., into a country that is almost unknown—uninhabited. A few crops have been produced there of exceptionally fine apples. They have taken a premium at some of the world's fairs, and it is proposed now to open up the country and develop the apple industry. A railroad is projected into the heart of the mountains from East Tennessee, and we have mapped about 500 square miles, under a good many difficulties of getting transportation and of living, as a basis merely for the safe developing of the apple industry of that country. Incidentally, of course, we have the peaches, which do best along on these sandier soils represented on that map by the deep yellow color.

In the work in North Carolina the North Carolina department of agriculture has cooperated very heartily. They have paid the field expenses this year of our men, but they of course have relied upon us for the expert assistants, as we have trained men for this work and there are none others to be had, and for the general direction and control of the work

I would refer again to the work we are doing now, or about starting, in Texas on the soil survey of the tobacco district, tobacco soils. The region in east Texas, where these soils are located, is almost uninhabited. It is a large area, almost entirely in forest, and where the lumbering interests are very large. These soils are exposed on narrow ridges and run through a number of counties, and we found the value of them for tobacco simply through our investigations the past two years.

Representative HENRY. Just what part of Texas do you refer to?

Mr. WHITNEY. Do you see the small red area there [indicating]?

Representative HENRY. Yes; southeastern Texas.

Mr. WHITNEY. It is just east and north of that. I am inclined to think, Mr. Chairman, although I do not know positively, that these same soils, these fine tobacco soils, extend into northern Louisiana, though Dr. Knapp has told me he thinks it is the same character of country, and I should not be at all surprised if the area of it would be considerable, but it is exposed in just little ridges. It may be 500 acres, it may be a quarter of a mile wide and 3 or 4 miles long; but it has got to be mapped. I do not know myself just where it is. I have driven over the area and have a general idea of where the lands lie and a general idea how much there is, but the tobacco industry has got to be developed on these soils and no other, because we have tried ourselves, and there have been numerous other attempts in that country to raise the tobacco on the light soils that they have already cleared without any desirable results.

Representative HENRY. How far have you gone with your experiments?

Mr. WHITNEY. We have produced a tobacco that compares favorably with a 25-cent Cuban cigar—25 cents in Habana.

Representative HENRY. Twenty-five cents?

Mr. WHITNEY. Apiece.

Representative HENRY. Indeed.

Mr. WHITNEY. It has the same characteristics.

The CHAIRMAN. That is on this little strip in Texas, you mean?

Mr. WHITNEY. On this little strip in Texas.

The CHAIRMAN. Was tobacco being raised there before you investigated the soil?

Mr. WHITNEY. Yes; I went down to Texas several times two or three years ago and investigated the matter as well as I could then. I gave some encouragement to the people, and they grew, partly at my suggestion, about a thousand acres. It was entirely without success. They had no success whatever, and it has been a complete failure. Last year they grew only about a hundred acres in the State.

Representative HENRY. You mean by last year 1902 or 1901?

Mr. WHITNEY. 1901. We sent down a party of experts last spring after we had completed the soil survey around Willis and grew a crop. Most of this was a failure. The crop we have on our hands now is most of it of poor quality, but there was a little that was grown on one corner of these red lands that is very fine. As soon as I saw the way things were going, that I had been mistaken in my first estimate of the soil that we wanted, I had our expert travel all over the State and look into every crop that had been grown in Texas, get permission to ferment it and handle it, so that we could judge of its quality, and then bring me samples from every soil where he could identify the crop; and invariably from this red land we got samples showing the character that we were looking for. We found in that way that we were able to locate the soil and the character of the leaf that we had been looking for and which I had recognized in all Texas tobacco. I knew there was some quality, but where it was I was unable to say. As a result of this investigation we were enabled to find out the character of the soil and the leaf that gave that value to a crop that is otherwise exceedingly inferior.

Representative HENRY. You spoke of red lands. Do you mean red clay?

Mr. WHITNEY. It is a clay; yes. It is not a heavy clay. It has some gravel in it. Characteristically it has some iron gravel.

Representative SCOTT. You think the reason these people failed in the first instance was because they did not get the right kind of tobacco?

Mr. WHITNEY. They did not get the right kind of soil. I have had a report about it. Our men have been looking around for this soil. They have found 4 acres at Woodville. They have found 3 acres at Poes Station, which is simply a lumber camp on the railroad. They have found two areas of 3 acres each at Nacogdoches, and that is all the cleared land of that kind we can find in east Texas. The rest is in forest.

Representative GRAFF. But there is plenty of such land.

Mr. WHITNEY. There are quantities of it. It just happens that the light lands have been cleared first, partly because they are valley lands along the railroads and partly because they are easier to till.

The development of the tobacco industry in Texas is a soil problem. It must follow the soil survey. At least it must follow the soils that we will establish through our survey as existing through that country. Of course it is not necessary for us to cover the whole area, but we must know where these soils are in a few areas, and we must understand their property thoroughly when we see them again.

It is proposed to send two soil-survey parties the 1st of January to work in east Texas. I do not know how long they will stay; perhaps for three months and perhaps for six months; perhaps one of them for the entire year. That is a question to be determined later; but we want to have a sufficient area surveyed so that when we attain the success that I hope we will with the crop this year, people will know where to locate and will know what soil it is necessary and desirable to clear.

Representative GRAFF. Was that soil that you were mistaken about the red soil?

Mr. WHITNEY. No, sir; I thought we would get our best success on a lighter soil. We do make those mistakes, but we take advantage of them when we can.

The Bureau has also done some work on the sugar-beet problem. You all know that the sugar-beet interests have been through many ups and downs. Many factories have been erected, capital has been subscribed, and the lands that have been taken up have not yielded what they should, or there has been labor troubles, or the farmers have been dissatisfied with their pay; and many of the factories of the country have been closed for one reason or another. This involves a loss, of course, of a large amount of capital.

Unquestionably, the yield of beets and the yield of sugar from the beets is largely a soil problem. There is no doubt that beets grown on some soils will yield more in actual weight and in weight of the sugar, and the problem to determine the character of the land adapted to sugar beets is one that the Bureau ought, and expects, to take up. In Arizona they told me two years ago that they had soils there that would produce 1,000 pounds of sugar to the acre. They had some that would produce 1,500 and some that would produce 3,000 pounds. That is one of the interests that I hope the Bureau will be able to help develop, to contribute to the success of the beet-sugar problem by a full investigation of the soils and the mapping of soils adapted to the highest sugar production.

I think the work of the Department in Connecticut in the establishment of the Sumatra interests there will fully justify the extension of the work on either side of the Connecticut Valley, to take in some of the supplementary valleys and some of the smaller contributory valleys, and also for the extension of the work northward into Massachusetts and up into the State of Vermont.

Representative HENRY. And New Hampshire?

Mr. WHITNEY. And New Hampshire.

The CHAIRMAN. Do you mean to justify private capital in taking it up?

Mr. WHITNEY. No; for the soil survey. Capital can not safely develop the Sumatra tobacco industry, except on the basis of the soil map, unless they know the soils that it is worth while to take up.

In regard to the importance of that matter, I may say that Mr. Floyd, who was connected with the Department and who developed the Sumatra interests in Connecticut, is working now for a private concern. They have spent $115,000 on 100 acres. That includes the erection of a warehouse for $8,000, the erection of barns that cost about $20,000, the erection of shade over 100 acres of land, the purchase of cloth, and the cultivation and handling of the crop.

Representative HENRY. And the erection of curing sheds?

Mr. WHITNEY. And the erection of curing sheds. I am informed—this is hearsay; it is not official; I am not sure of my exact figures—but I have been informed that they have produced about 120,000 pounds of tobacco. Unfortunately the last picking was caught in an early frost and their top leaves and a few of their next to the last primings. They have produced, however, on their hundred acres 120,000 pounds of tobacco, which they expect to get $1.50 a pound for, giving them about $180,000, with an expenditure of $115,000; so that they will pay for the cost of their land, the erection of their plant, and the care of this tobacco, and have a surplus of about $60,000. I think I am about right on those figures, Mr. Henry.

Representative HENRY. Yes, I think so, approximately.

Mr. WHITNEY. So far as we can tell.

Representative HAUGEN. Does that include the erection of the sheds and everything?

Mr. WHITNEY. Everything; the purchase of the land, curing shed, and warehouse.

Representative HENRY. I might add that the crop this year has been lighter than usual. It was a wet season and the harvesting was delayed until the middle or last of October.

Mr. WHITNEY. It was unusually late, and it was caught in a freeze.

Representative SCOTT. What is that land worth, Mr. Henry?

Representative HENRY. They bought 400 acres of it for a nominal price. Some of it had been sold for taxes. It was covered with growth of birches and stunted pines. They pulled those out and put in over 100 acres on that land. They have more lands to develop. They paid a nominal price for it, but land like it is being sold to-day for $50 to $75 an acre.

Representative SCOTT. Did they have to fertilize it before raising this stock?

Representative HENRY. Oh, yes; it was grown altogether on fertilizers.

Mr. WHITNEY. It cost them about $650 an acre to raise the crop.

Representative SCOTT. All they bought, then, was the foundation for the fertilizer?

Representative HENRY. That is all.

Representative SCOTT. What did you say the cost for fertilization was?

Mr. WHITNEY. That was for all the fertilization—the whole cost.

Representative SCOTT. The whole cost was about $650 an acre?

Mr. WHITNEY. Yes, sir. They spent also about $400 an acre on their improvements, you understand,

A REPRESENTATIVE. Sheds?

Mr. WHITNEY. Sheds and warehouses. They have a railroad in there. They have gone into it on a most elaborate scale, and they have paid it all back and have about $60,000 additional. The interest in the work is of course growing enormously. There is a good deal of capital going into it. There have been 700 acres this year under shade, and the crop is estimated to be worth about a million dollars. Next year it will probably be twice that amount.

Representative GRAFF. A smaller farmer, though, could not engage in that business profitably?

Mr. WHITNEY. Yes; they have as much as an acre or 2 acres, but it is not so profitable as with a large concern, and that is going to be the case with the Texas tobacco also. We are going to be able to produce, Mr. Chairman, in Texas a tobacco which can be grown and baled for 15 cents a pound. It will be worth from 30 to 70 cents.

A REPRESENTATIVE. Could that also be grown under shade?

Mr. WHITNEY. No, sir; it will be grown in the open, but that will probably also be developed through capital—that is, a small farmer can not raise the crop and sell it for what the New York trade is willing to give. A large concern can go in and produce it on a commercial scale and get a better profit and raise it for a lower price. They could get a better market for it than a small grower.

Representative DAHLE. Why is it that the large dealers can do better than the small ones?

Mr. WHITNEY. Well, they have larger orchards. Then they can get their crops down from the mountains on tramroads that a small grower could not think of erecting. They can have men specially trained for spraying their orchards. They can get spraying outfits that they can get up on the sides of the mountains that a small grower can not handle; and so they can produce a better crop with more economy if they have large interests than if they have small interests.

Representative WILLIAMS. Above all things, they can have a man in the market where they sell, to watch it?

Mr. WHITNEY. Yes, sir.

Representative WILLIAMS. They can afford to pay one to stay there?

Mr. WHITNEY. Yes, sir.

Representative COONEY. I would like to ask one question there in reference to this soil survey and these maps and the results. Is this survey made with the special idea of developing their soil for one certain product, such as down in Virginia for apples, in Texas and Connecticut for tobacco, and in Arizona for beets?

Mr. WHITNEY. No, sir; not at all.

Representative COONEY. Just explain that.

Mr. WHITNEY. But it happens that in most of these sections there are special crops that are being introduced. In fact, there are very few sections of the country now where there are not special industries growing up and that need to be fostered, or which it is well to foster. We have on the coast our truck soil for the growing of vegetables. We have in the mountains the fruit soils; and we have the sugar beet and rice and many special crops that are adapted to certain areas.

Representative COONEY. Suppose in one of these surveys you find other crops that could be grown equally well upon a peculiar soil; are they taken notice of by the survey?

Mr. WHITNEY. Surely. All the experience we can bring from other areas is given.

Representative GRAFF. Is it not true that in connection with the mapping of the soils and the map itself there is an article on the subject of the different soils, and then each classification of soil discussed and the various products that are suitable to that soil are mentioned?

Mr. WHITNEY. Yes; that accompanies the map in the report. We aim to point out all the special features that it is possible for us to do with the experience and knowledge at our command.

There is just one other problem that I would speak of that I think may interest you. We made a survey this year of the Abbeville area of South Carolina. It is on the Piedmont plateau, and I have just received the report and map on that area. It was certainly very interesting and very instructive to me to see what these men that had been in charge of the survey had determined about that area. In the first place, they went on to say that the area was originally one of the best stock regions of the country. It was so famous for the fine character of stock raised that there were laws against the importation of the inferior stock of Virginia. The country was covered with a hard wood growth, with abundant growth of grass to give pasturage, and for a long while the stock interests were of paramount importance.

The CHAIRMAN. What is the elevation? Do you remember the elevation?

Mr. WHITNEY. The elevation is about 800 or 900 feet.

The CHAIRMAN. What is the soil, a limestone?

Mr. WHITNEY. No; it is from a granite or other igneous rock. It is a strong clay soil. It is splendid. These red lands you see from Washington down to Alabama, 900 miles in length.

On this area in South Carolina the hard wood has been removed. The first cultivators had splendid success with silk. Charleston was an important market for the exportation of silk to France. Silk was produced in the Abbeville area in quantities and at considerable profit. They produced indigo. They produced wheat and grains of all kinds—flax; and the yields were twice as great as the yields to-day, bringing them to something like the yields that we get in our Northern States. With the change in conditions in the South, with the growing up of the one idea of the production of cotton, all of these side industries have been lost. The land has been farmed through clean cultivation for cotton alone. The yield of grain is but nine bushels per acre to-day. Grass is almost unknown. The lands are washed and gullied, and the area of this clay is extending and the area of the sandy loams is diminishing as the sandy covering is being washed from the ridges and level areas. We have to-day the conditions that exist in the South, with the one crop (cotton) in competition with the fertile lands of Alabama, of Mississippi, and Texas, and the question now is, What can the people do in place of this one universal crop of cotton that is no longer productive?

It seems to me it is an interesting thing to trace back to the early days and find that they were growing a greater variety of crops; but the conditions at that time, at least, were adapted to more crops than they now grow, and it gives us a hope of extending the present range of crop interests.

Mr. Chairman, I would speak a word in regard to the work in Porto Rico and the island possessions. Before the bill was amended in the last appropriation bill, we had sent a party to Porto Rico, as the Comptroller decided we had a right to do, and made a survey across the island from Ponce to Arecibo. We took in a strip, as you will see in the small sketch map, and we covered about one-tenth of the island for about $1,500. As the result of that work the feeling arose on the island that we ought to do something to develop the tobacco interests. Two years ago, when Porto Rico was annexed to the United States, Porto Rican tobacco was introduced in large quantities in this country, and it was predicted that it was going to wipe out our domestic leaf. The governor-general at that time sent me a large number of samples which we examined in the Department, and I certainly found no evidence of any desirable qualities. After that the experiment station and the governor of the island sent us a lot of samples and I found no evidence of good quality. However, the fact that it was from Porto Rico—the fact that it was from an outside country—took with the trade, and for two years Porto Rican tobacco has been immensely advertised and has sold at a high price. To-day the phrase in New York "as dead as Porto Rican tobacco" is applied to something that has hopelessly died out.

As it is one of the important industries of the people, as it is the third crop in importance in the island, the experiment station has applied to us very earnestly, through Dr. True, for help in this. They are not able, with their appropriation of $15,000, to employ one of these experts. They can not get one unless they give a high price, because they would have to get one who could direct his own——

The Chairman. You mean the $15,000 of the Porto Rican experiment station?

Mr. Whitney. Yes.

The Chairman. Is not that supplemented by an appropriation from the local government?

Mr. Whitney. No, sir. They had some money for land. They had a grant to enable them to purchase land.

The Chairman. But no annual appropriation?

Mr. Whitney. No annual appropriation, and they have appealed to us to help them out with, at any rate, an opinion, through a personal examination into the subject of the possibilities of doing something to improve the quality of the Porto Rican tobacco.

We are entirely prevented at present from even sending a tobacco expert over to look into the matter by the wording of the agricultural appropriation act, and I thought I would bring the matter up because there are problems that can be handled, if you desire to have it done, without an increase in the appropriation. It is just a question of whether we work in Porto Rico, or in Texas, or in Ohio, you understand. We would send one of these men to Porto Rico, if it is the wish of the committee that we should do such work, but at present the industry of raising tobacco, which is third in importance of the industries of the island, is in a very unprosperous condition. What can be done I do not know and could not determine until we have had some of our men look over the situation, and that can not be done with the present wording of the act.

Representative GRAFF. There was something said the other day by one of the heads of the Bureau about the coffee interests of Porto Rico. He stated that they were very large and very promising. Would your soil survey there be of any benefit to that industry?

Mr. WHITNEY. Yes; in the strip that we outlined we show the character of the coffee soil, and in fact we show a strip right across the island taking in coffee soil, banana soil, rice soil, and sugar cane soil. We selected it for the reason that it would lead us through the representative industries of the island. That report will come out in our next report.

Representative DAHLE. What are the two crops that are ahead of tobacco in Porto Rico?

Mr. WHITNEY. Sugar and coffee. First sugar, then coffee, and then tobacco.

Mr. Chairman, I think that is all. I would suggest that we have Mr. Means here, who is in charge of the alkali land reclamation work and who has just been to Egypt. I thought the committee might like to hear him.

The CHAIRMAN. We shall be very glad to hear him.

Mr. WHITNEY. And then Professor King.

Representative HAUGEN. Just before that I would like to ask a question. What part of this country do you consider the most desirable for sugar-beet growing?

Mr. WHITNEY. Of course that has been very generally outlined by Dr. Wiley from his investigations in the chemical composition and climatic condition; but in that belt which extends through the Northern States and dips down into Arizona and up to California again the character of the soil has not been determined. The climatic conditions are right, but there is a variety of soils that ought to be investigated.

Representative HAUGEN. You stated that a number of these factories had not proven successful. Where were they located mostly that they were not a success?

Mr. WHITNEY. The factories at Rome and Binghamton, N. Y.; the factory at Chino, Cal., has been closed down. There were about $500,000 invested there. That was due to alkali.

Representative GRAFF. I know of one at Pekin, Ill., in my district, where there were $250,000 invested, which was closed because it was not found profitable, and it was converted into a glucose or corn-sugar factory.

Representative HAUGEN. Did you say the most favorable land in this country, the most productive land, only produced not to exceed 2,000 pounds per acre?

Mr. WHITNEY. About 3,000 pounds.

Representative HAUGEN. That is considered a high yield?

Mr. WHITNEY. I think so; I understand so. A factory in New Mexico has been closed. By the way, we could have saved that if they had listened to us. There is an alkali problem there, but they would not hear of anything of the kind, and they closed down the next year after we advised them to change their methods.

The CHAIRMAN. Now we will be very glad to hear from Mr. Means

STATEMENT OF THOMAS H. MEANS, OF THE BUREAU OF SOILS, DEPARTMENT OF AGRICULTURE.

The CHAIRMAN. Go ahead, Mr. Means, in your own way.

Mr. MEANS. About 1897 the Division of Soils commenced some investigations upon the alkali soils of the West by starting work at Billings, Mont. Our recommendation at that time was that drainage would solve the problem. Since then we have investigated districts in every one of the arid States except Wyoming, Oregon, and Nevada, I believe, and have studied typical conditions in all of these States, and in every case our recommendation has been that drainage will solve the problem.

The CHAIRMAN. Drainage?

Mr. MEANS. Underdrainage. According to the census of 1900 there are about 7,500,000 acres irrigated in the West. We have surveyed approximately 3,000,000 acres typical of the entire irrigated area, and we find that in that 7,500,000 acres approximately 13½ per cent of the land is so charged with alkali that it would be of no value for crop production; in other words, that of the land which has been farmed 13½ per cent are now worthless. The majority of this land was at one time good. It was the first land taken up. It was the best land. It was the easiest land to farm. But through careless methods of farming and through ignorance on the part of the farmer or carelessness of his neighbor, alkali has come to the surface, and this land is worth nothing now.

Mr. Newell estimates there are probably 75,000,000 acres of land in the United States irrigable, and I think this same ratio of 13 per cent will probably hold in the whole amount of irrigated land. In other words, that if we would enlarge our irrigated area, still using the same methods which have been used in the past, we would still lose 13 per cent, or, in round numbers, one-tenth of the land will be ruined.

The value of this alkali land is nominal. It is worth nothing, as a matter of fact, for production, but it can be bought anywhere at from $5 to $10 per acre. Of course, if it was owned by the Government at the present time it could be taken up under the homestead act at $1.25 an acre.

Representative HAUGEN. One hundred and sixty-acre tracts.

Mr. MEANS. One hundred and sixty-acre tracts, under the homestead law. We have estimated that this land can be underdrained and brought back into cultivation by the expenditure of anywhere from $10 to $20 an acre; and from experiments which we have carried on, which I will describe in a moment, our estimate is a perfectly just one.

This summer I was detailed to accompany one of the agricultural explorers of the seed and plant introduction, Bureau of Plant Industry, to Algeria and Egypt to assist him in work for the gathering of seeds of alkali-resistant crops for introduction into the West, and incidentally I gathered a great deal of information about the reclamation of the alkali land in Egypt and the use of alkali waters for irrigation, which we can use in this country. I found that in Egypt, where they have been farming for 7,000 years, they have solved this alkali problem. Under the Pharaohs practically all of the land in the Nile Valley and the delta of Egypt was cultivated. At the present time around the margin of the delta there is a fringe of salt lakes, alkali lakes, or lakes which are covered with salt water at extremely high tide. This land is now out of cultivation, and throughout Egypt there are areas where the land has been abandoned, has been allowed to lie idle for a period of years, and in every case alkali has come to the surface, showing that throughout the subsoil underneath Egypt there is a small amount of alkali, which, if allowed to come to the surface, will ruin the land.

An English company started work at a point a few miles east of Alexandria in 1889 with a capital of about £300,000, or about a million and a half dollars. They decided to undertake the reclamation of Aboukir Lake, about 30,000 acres in extent. At the time they started to work the soil carried about 8 per cent of sodium chloride, common salt, or ten times as much as we find plants can stand. When I visited the tract this summer there was an area of about 15,000 acres producing crops, and the company this year declared dividends of 20, 20, and 5 per cent—45 per cent—upon their capital. The results which they have obtained in growing crops show that the proposition is successful agriculturally.

The CHAIRMAN. What is their chief crop?

Mr. MEANS. Their object is to grow Egyptian cotton, but in rotation with that they raise clover and corn.

The CHAIRMAN. Do they raise clover as a manure?

Mr. MEANS. They raise clover as a manure and as a forage crop also. It is the Egyptian clover, the berseem. It is not grown in this country at all. I think the dividend of 45 per cent in one year shows the commercial success of the proposition.

As I said, we have in this country at the present time lying under existing irrigation canals about 1,000,000 acres of ground which can be brought back into cultivation. There has been nothing done upon that land so far. I made a rough estimate the other day that in the last twenty years there have been issued something like 1,100 pages of matter upon alkali soils, and there has been enough of this literature distributed to give every farmer in the irrigated West 210 pages of reading matter. The result of this wholesale distribution of reading matter has been the reclamation of certainly less than 500 acres of land. In other words, there has been nothing done at all. So that to start this business we will have to attack it from some other side than by publications.

We find that the interest is increasing in the West. We have bombarded them with our artillery of publications, and I think now if we follow it up with little infantry we can get something done. We have gone into one or two districts. We started to work in Utah. We went in there and they were skeptical of the proposition. By talking around a little while we found one shrewd old farmer who said he would put up $10 an acre on 40 acres of land if we would superintend the work. We made a three-cornered agreement with the Utah experiment station and this farmer and at an expense of about $650 we installed the drainage plant and have it in operation. Of this the owner of the land paid $400 and the Utah experiment station and the Department put up the remaining $260. I think next year we will have growing on that land some crop of value, on land which heretofore has been worthless: at a cost of $16.60 an acre for the installation and reclamation, and that includes digging an outlet for the drains.

The estimated cost of the drainage itself, throwing out this expensive outlet, was $13.50 an acre; so that our original estimate of from $10 to $20 an acre is a very just one.

Now, at Salt Lake City there are 60,000 acres of such land. The land can be bought at present at $10 an acre. As I said before, it is worth nothing. We can instruct farmers to dig main canals and drain this land for a cost altogether of about $18 an acre. The land when reclaimed is worth $75. Irrigated lands should be worth more, but the average value of land around Salt Lake City is $75, leaving a net profit of at least $40 an acre.

We have commenced work at Fresno, Cal., upon similar lines, and there we find the people ready to put up money for the work. We have had to expend a small amount of money—I think $300—on a demonstration at Fresno, and now we have a number of other parties who are anxious to provide the money if we will simply superintend the work—show them how to do the work. Inside of a few years there will be at Fresno a large drainage district installed and the land drained.

The CHAIRMAN. Is it just ordinary tile drainage?

Mr. MEANS. It is just ordinary tile drainage. As I said, in 1897 we made the recommendation, and it has been made by other people, but nothing has been done until we have gotten out and shown the farmers that the land can be brought back to cultivation.

Representative GRAFF. What sized tile do you use?

Mr. MEANS. We use 3, 4, and 5 inch tiles—the same sizes that would be used in Illinois—running up into 10 and 12 inch drains and then into open ditches.

Representative GRAFF. It is more expensive than a drained farm would be in Illinois.

Mr. MEANS. It is practically the same thing used in Illinois.

Representative GRAFF. On the same plan?

Mr. MEANS. The same plan.

Representative COONEY. How far do you put them apart?

Mr. MEANS. We are putting them some 150 feet apart, some 200, some 300. Others we may put closer together.

The CHAIRMAN. You say that solves the problem of alkali rising to the surface?

Mr. MEANS. That will solve the problem of alkali rising to the surface. It not only reclaims the land, but it will prevent any further rise of alkali.

The CHAIRMAN. How do you account for that? What is the scientific reason?

Mr. MEANS. We have drainage that furnishes an outlet for the surplus water. We irrigate the land, the salts are dissolved, go out to the drains, and are carried off into some lower place.

Representative WILLIAMS. It is leaching.

Mr. MEANS. Yes, sir.

Representative GRAFF. The drawing power of a tile is wonderful. I do not know whether you tile much down in your country, Mr. Williams?

Mr. WILLIAMS. Not at all; but I have seen tiling.

Representative GRAFF. With just a little 3-inch tile you can see the evidences of it where the moisture moves toward the tile. There is a streak clear across the field, many feet wide.

Mr. MEANS. One reason that we are insisting upon the farmers taking up this class of work now, or trying to get them to take it up, is the fact that there is great talk of extension of irrigation through the West. I think it is more profitable at the present time to reclaim land now under the existing canals, land which is already ditched for irrigation, already fenced, and very often has a water right. All that is needed now is to get rid of this salt and excess of water and put the land back into cultivable shape.

This morning's papers announce the completion of the Assouan dam, on the Nile. The purpose of that dam is to store up the flood waters of the Nile to supply the irrigated region of Egypt. As a matter of fact, it was built to supply water for the land already lying under the canals. There are 380,000 acres of land which they are going to reclaim. This dam will not be used to extend the irrigation out onto the desert, but to take up lands lying immediately under the canal.

We have a million acres of this character of land in America, which can be more profitably brought back into cultivation than by taking public lands which are higher up. At the same time, this method of drainage, if carried out in the districts, will absolutely prevent any possibility of irrigation on higher levels damaging lower lands. That is, if this method is followed out in the extension of the irrigated area of the West there need never be any more than 13 per cent of land lost by alkali, and it requires but a demonstration in a number of places throughout the West to prove this fact to the farmers.

The CHAIRMAN. Such a simple thing as that you would think would not need much demonstrating?

Mr. WHITNEY. Mr. Chairman, they have been talking about this in India since 1859, and every year the government reports that more and more villages are being deserted and lands are being neglected simply for the reason that they have not had the confidence to go on with the work.

The CHAIRMAN. That is extraordinary. Of course they have to deal with a bull-headed class there?

Mr. WHITNEY. Yes.

Representative HAUGEN. Of course this can not be done unless you have an outlet?

Mr. MEANS. This can not be done profitably unless we have cooperation among the farmers so that an outlet can be secured. It is costing us $16.60 an acre for a 40-acre tract. We could put that onto a 10,000-acre tract, and the proportional cost of the outlet would be very much smaller. We could do it for $13 an acre. In other words, we could save $3 an acre by taking up larger tracts.

Representative GRAFF. Is not your one demonstration in the vicinity of Salt Lake City sufficient there?

Mr. MEANS. That is sufficient for that country; yes.

Representative GRAFF. Your opinion is that the only way to induce these people to take up this system is to go there and educate them?

Mr. MEANS. Yes, sir.

The CHAIRMAN. Give them an ocular proof of it.

Representative GRAFF. That is about all that will do it.

Mr. MEANS. That has been our experience; and now we find, when they have gotten some ocular demonstration in one place, that they are willing to put up money for the same work in some other place.

Mr. WHITNEY. They take it up themselves.

The CHAIRMAN. Then they will take it up just as fast as the needs of the country demand it.

Mr. MEANS. They will, in a short while, adopt our methods and organize large companies.

The CHAIRMAN. How long have you been at this kind of work?

Mr. MEANS. I have been since 1897 in this character of work. I have been in the Department nearly eight years.

Representative GRAFF. Is this the first demonstration you have ever made for the Department—the one at Salt Lake City?

Mr. MEANS. This is the first.

Representative GRAFF. And the only other place it has ever been tried is in Egypt?

Mr. MEANS. The only other place on a large scale. In Spain, southern France, and northern Italy there has been some work done, but not on a large scale.

Representative GRAFF. But it never has been tried in this country?

Mr. MEANS. It has never been tried in this country on a large scale.

Representative HAUGEN. How large a tile do you use in Utah?

Mr. MEANS. We are using, as the smallest, 4-inch tiles.

Representative HAUGEN. 150 feet apart?

Mr. MEANS. 150 feet apart.

Representative HAUGEN. How deep do you lay them?

Mr. MEANS. We have them there 4 feet deep, on the average.

Representative HAUGEN. It is not necessary to have them so deep as that?

Mr. MEANS. No; we think that is unnecessarily deep, so hereafter we will put them 3 feet.

Representative HAUGEN. How much do you pay for tile there?

Mr. MEANS. We are paying just about twice the price they are paying in Illinois. It is being made at Ogden, 30 miles from Salt Lake City. If this work is gone into extensively, we will have to make tile right on the ground. It does not pay to haul it. We are studying the question of clays for tile making in every district we enter.

Representative GRAFF. How do you know this was a success in Salt Lake City? You did not have an opportunity to raise a crop on it?

Mr. MEANS. No. As I say, the installation has simply been made. We have only been able to irrigate the land once. We put on fresh water and we got off water running from 2 per cent to 3½ per cent of salt. In other words, the water came off about as strong as ocean water for a while. We have gotten about 130 tons of salt already out of that 40 acre tract by one irrigation. By flooding that piece of land three months next spring I think the surface will be sufficiently sweet to put on some crop which will stand in water.

Representative GRAFF. I thought possibly it would take you two years.

Mr. MEANS. We will not get it back into thorough shape for two years, but we will get some sort of a crop the first year.

Representative HAUGEN. Water is pretty scarce, is it not?

Mr. MEANS. No; we get water out of the Jordan River.

Representative HAUGEN. But I understood fresh water was very expensive out there.

Representative GRAFF. This system would not be practical except on irrigated lands?

Mr. MEANS. No; you would have to have a supply of water to irrigate the lands.

Representative WILLIAMS. You do not have any alkali lands, though, except where you have to have irrigation?

Mr. MEANS. No, sir.

Representative WILLIAMS. Where you have plenty of rain, the rain itself leaches the soil.

Representative HENRY. There is some rainfall there, is there?

Mr. MEANS. About 16 inches at Salt Lake City.

Representative HENRY. That helps you out, does it not?

Mr. MEANS. Yes; that helps us out

Representative GRAFF. What other places had you in view?

Mr. MEANS. We are planning this year to go back to Montana to put in an installation there, and we probably will carry the work into Washington State in the late summer and extend it wherever there is a demand for the work after that.

The CHAIRMAN. What other work have you done, Mr. Means, besides that at Salt Lake City?

Mr. MEANS. We started the work at Fresno.

The CHAIRMAN. Do you get the same results there?

Mr. MEANS. We are just now putting in the tile. The men are at work there now.

Mr. WHITNEY. Mr. Means has been in charge of the soil survey, but is just being detached from that to make these demonstrations—to take charge of them. So far as we can, Mr. Chairman, we are trying to build up commercial things and then let it drop.

The CHAIRMAN. That, of course, is as far as the Department ought to go, to show these people what they can do, and if they do not want to do it, it is their fault, not the fault of the Government.

Mr. WHITNEY. But at first they do not know.

The subcommittee (at 3.30 o'clock p. m.) adjourned until Friday morning, December 12, 1902, at 10.30 o'clock.

SUBCOMMITTEE OF COMMITTEE ON AGRICULTURE,
HOUSE OF REPRESENTATIVES,
Washington, December 12, 1902.

The subcommittee met at 10.30 o'clock a. m., Hon. J. W. Wadsworth in the chair.

The CHAIRMAN. We will hear Mr. King.

STATEMENT OF F. H. KING, OF THE BUREAU OF SOILS, DEPARTMENT OF AGRICULTURE.

Mr. KING. Mr. Chairman and gentlemen of the committee, Professor Whitney outlined to you yesterday the general purposes of the soil survey, and pointed out to you some of the commercial results that have been attained. After an area has been surveyed and its soil types have been mapped out, and the special crops to which those types are peculiarly adapted have been indicated, the practical man, as soon as he comes to the soil in question, and attempts to apply the knowledge that has been set forth by the survey, is immediately confronted with questions of proper management of that soil, in order to bring about the results that are predicted may be obtained from the soil. The line of work which has been placed under my charge relates especially to questions of soil management. It is seen that in many localities where soil surveys have been made there will arise special problems of soil management which need to be considered.

I can perhaps give you in the shortest time an idea of the field we are attempting to cover by outlining in a somewhat didactic way the scope and objects of soil management. If I do this, we may say in the first place that soil management aims to establish on a given field uniform surface conditions of the soil; in the second place, it is necessary to recognize whether the structure of the soil—its texture, its granulation—is in the proper condition, and if it is not in the proper condition to apply such remedies as will give the proper textural or structural conditions in the soil.

Again, the crop before it comes to maturity must be subjected to the conditions which the weather imposes, and it generally becomes necessary to control and conserve the soil moisture, and there are various principles, physical and mechanical, which must be understood and applied in order to get the best results from the available moisture which the soil may receive and retain.

Then it is necessary, in the holding of a given type of soil up to its maximum capacity for yield, to maintain in that soil a proper amount of organic matter—a proper amount of humus. The amount that is necessary in one type of soil is different from the amount required in another type of soil, and the steps which may be taken for one type of soil under one rainfall condition are different from the steps which must be taken in another section on the same type of soil, but under different climatic conditions.

And so along such lines as these, in order to have the soil survey count for most in the shortest time with the least experimentation on the part of those who undertake to make the application indicated by the survey, it becomes advisable pecuniarily to point out, so far as may be, the specific lines of soil management that are likely to bring the right results, one set of indications applying to one locality and another set of indications applying to another locality and to another soil type.

Still again, it is necessary to maintain the right quantity and quality of dissolved salts in the soil water. A plant, like an animal, is feeding all the time on solutions. All living things get their sustenance from solutions rather than from solids. We take solids into our own digestive tract, but we convert them into solutions before utilizing them. And so the feeding of plants is fundamentally the same problem as the feeding of animals, and it becomes necessary, in order to understand the rationale of the application to land of farmyard manure, or of fertilizers of one kind or another, to know what there is in that soil solution against which the roots of the plants expose their surfaces; to know whether this particular ingredient of the soil solution or that requires reenforcing or reducing.

Yesterday there was outlined to you work contemplated in the reclamation of alkali lands. Now, there you have a problem in which, under the climatic conditions, the long decay of the soil has resulted in the accumulation of so much of very soluble matter that the water the soil can retain is too heavily charged with dissolved salts, and in that excessive concentration of salt the plant can not grow and we speak of the soil as alkali land. The processes which go on in those arid regions and which result in the formation of alkali are not different fundamentally from what goes on in the most humid climate. The same decomposition of rocks takes place. The same sort of salts form, but in the one case nature has provided in her heavy rainfall continual drainage, continual seepage, continual washing away of the more soluble materials; and the result is the salts do not accumulate to an excessive degree in most localities where the rainfall is above what occurs in the arid regions.

And so, in the reclamation of arid alkali lands, we must recognize that, if the improvement is permanent, it must be done on the basis of allowing the continual or periodic removal of those salts which may accumulate with time after they have once been removed. In other words, to simply reclaim such lands and then leave them, with no further treatment of them, makes it only a question of time when the same conditions will recur.

Throughout the country, whether it is in the arid region or in the semiarid, the humid or semihumid regions, we are confronted with these questions of proper strength of the soil solution, because so far as the materials which are in solution can influence favorably or unfavorably the growth of the crop, they have to be regulated, making them stronger or weaker as the case may require. So here is a very fundamental line of investigation which requires attention from the standpoint of soil management.

Then, again, it is necessary oftentimes to so change the character of the soil as to insure more complete aeration of it—to allow the air to go more deeply into the soil and to change more frequently than it ordinarily does under the existing conditions. It is a universal fact for all soils that unless the openness of them is such that the ordinary physical forces which drive air into and out of them again operate with sufficient magnitude to make the change frequently enough we get diminished yields.

Representative COONEY. It is a kind of lung power.

Mr. KING. Yes. The soil must be ventilated in the same sense and for the same reasons exactly that a building is ventilated, where people congregate, or a stable is ventilated. There exists in the soil the same necessity. We have it very forcibly illustrated in the city of Washington. My attention has been repeatedly arrested by the almost entire absence of tree roots in the soil under the air-tight asphalt pavements of our streets. If you will watch the cuts made through the pavement you will find that although the trees stand close by the asphalt pavement they extend no roots into the exposed soil, which is moist and appears to the eye in every way suitable for them. There is scarcely a root of any sort to be observed in soil so covered, but if there is a brick pavement adjacent here the roots are massed in immense quantities and so completely as to fill the soil and even raise the brick on the surface.

It seems to me we have here a serious problem, which the permanent improvement of the city of Washington should take into consideration if the maintenance of shade trees along the streets is desired. The small area of naked soil about the base of each tree which is left does not provide aeration enough to allow that tree to maintain its growth where cement walks are placed on the other side of the trees.

The CHAIRMAN. In place of the bricks?

Mr. KING. Yes; and in so doing we are really sealing the soil above the tree roots in and leaving too little space for ventilation. Many of these trees are now dying, and I fancy, from what I have seen, that one of the fundamental difficulties is the shutting off of the air from the soil about the roots.

It is, therefore, a practical question which should be considered where asphalt pavements are going in, whether it would not be helpful to the trees to lay out under the asphalt in the street and under the sidewalk lines of drain tile radiating out from the trunk even into the lawn part beyond, and thus allow more circulation of air in the soil, and thus broaden the feeding ground of the trees by providing better conditions for the growth of the roots.

It is this absence of air in the lower parts of the soil that largely forbids the sufficiently deep penetration of roots into an insufficiently drained soil to enable the plant to utilize the water and dissolved salts that are there. You may take any plant that we have and put it into clean running water, and apply to that water the necessary ingredients, those which are found in the soil water, and simply hold the plant there, and it will go on and thrive with its roots immersed in the water, provided that water is continually changing so that it is oxygenated water. But let the oxygen become exhausted and the plant is in exactly the same condition as fish when the oxygen ceases to enter the water as rapidly as it is consumed.

Now, in overwet soil such rapid changes of air can not take place, for then it must be by the very slow process of diffusion. Therefore, in the soil it is imperative that the ground water be lowered sufficiently to give a proper depth of soil in which there is sufficient open-air space to allow the wind, as it blows over the surface, to produce a suction that lifts the air out, and then with its change of pressure to let it go back again; just as you have observed on a strong, windy day, sitting in a room, that the carpet will alternately rise and fall; or as a tin roof is continually buckling under the rarefication that comes and goes with the wind; with the condensations and rarefaction that comes and goes with the changes of pressure. Just such changes go on in the soil. The air is alternately sucked out and allowed to enter, provided there is open-air space enough in the soil to allow such changes to take place. And they are essential to plant growth.

Representative SCOTT. Out in our country it has been the theory that drought could be guarded against most effectively by a mulch, a finely-pulverized soil to a depth of 2 or 3 inches. My idea has always been that that mulch was supposed to prevent the air from getting into the ground. I presume your theory would be that it prevents it from coming in too rapidly and in too great quantities.

Mr. KING. The effectiveness of the mulch is its tendency to prevent the loss of water from the surface of the soil by evaporation.

Representative SCOTT. And the more rapidly air gets into the soil the more rapidly evaporation will take place.

Mr. KING. But the evaporation by change of air, the air going in and and coming out, is a very small part of the total evaporation. The chief loss of water by evaporation from the soil is the loss that takes place right at the surface. But a mulch has a double function, the one generally recognized, as you point out, the tendency to diminish the intensity of drought conditions, but there is another function which is equally important, that of retaining the dissolved salts sufficiently below the surface, so that they remain within the zone of the roots. If the surface of a soil is not mulched it allows the water to come directly to the surface, and the water that comes up to the surface brings with it the plant food which the water contains. When that water is evaporated you lose not only the water, but at the same time the salts which are laid on the surface of the ground above the roots.

If you have a mulch on the surface such that evaporation must take place from its under side, not from the upper side of the mulch, and the lower layer remains moist, then as the water keeps coming up and evaporating from the under side the salts are left there in the moisture, where the roots can place themselves in contact with it and take advantage of the salts as well as of the water.

When a soil is imperfectly drained, so that you have only 12 or 18 inches of sufficiently aerated soil to allow the roots to develop in it, then, if there comes a time in the growth of corn, for instance, or in the growth of oats, when it demands water in such extremely large quantities that capillarity from below can not supply it, a condition of drought for any of these crops is developed, and the ten days or two weeks which may follow such drought condition is likely to reduce the crop one-quarter or one-half, when if similar conditions occurred at an earlier period or a later period it would not affect the crop so much, simply because the amount of water that was demanded during that interval was so great that with the roots all confined in so shallow a zone capillarity from below that zone was not strong enough to bring up sufficient water to enable the crops to get what was needed, and the rate of growth must be determined by the rate at which the materials for growth can be had.

We have in the South, where we were doing work this summer, these conditions intensified. Although the soils are coarser than we have in Wisconsin, and naturally more leachy, yet crops have actually stopped growing there this summer, and the corn leaves have curled badly, when below the second foot the soil was too wet for any crop to grow well in it.

The difficulty there has been the crops have had their roots confined so close to the surface that they dried that part of the soil out so much that the water did not come up readily from below. The rate at which capillarity can bring water into a soil is greater if the soil has a certain degree of moisture in it, and it is very slow after the soil becomes dry—just as you try to wipe your face with a perfectly dry towel. It does not take up the moisture anything like as readily as a cloth a little damp does; and in the wiping of dishes the same experience is had.

So the necessary methods of tillage, which will lead to the development of better physical conditions, need to be better worked out and applied in the South.

We have along the Atlantic coast area, especially through the South and around toward the Gulf, a tract of land that, although in many cases the physical properties of the soils are such as to compare well with our soils in the West, yet their natural productiveness is very much below our natural productiveness. Not only that, but they have the peculiarity of washing with extreme ease. Very small rainfalls tend to move the soil from place to place with very great destructiveness, so much so that they are obliged, on very small slopes of ground, to plant along the contours of the field and to cultivate along the contours of the field in order to prevent that excessive washing.

It is very important as a basis for legitimate practical work to understand why it is that those soils wash so much more easily than our soils in the North do. We have found from our study in the vicinity of Goldsboro, between Raleigh and Newbern, that although there is a granulation of the soil at the surface that corresponds somewhat to the granulation of the soil that occurs farther north, yet in some way that granulation is so feeble that the small particles are brought together into large clusters and held there with so little force that when the rain falls on them the clusters break down, and the more completely they break down, and the smaller the individual particles become, the easier they float away in the water; that is, the larger surface they present in proportion to their weight, the easier they are carried off; and it becomes a question of very great practical importance in all of that wide stretch of country to ascertain whether there is not some way by which we can increase the degree of intensity of granulation so that the rains will not dissolve the granules and carry off the silt particles so extensively.

With almost every rain we had there this summer, even if it was a rainfall of not more than half an inch, immediately afterwards the streams increased in volume and the water ran off not only turbid—that is, carrying the finest particles from the field, which are the most valuable in those naturally coarse soils—but they ran away carrying the dissolved fertilizers and natural salts which had been brought up by capillarity and left by evaporation on the surface, so that the soils were being depleted both of their most essential physical ingredients and of the dissolved salts also.

Now, if those soils could be deepened and the water could be taken off from a lower level, just as we do in the West in our tile drainage, so that the water when it falls on the surface, instead of being allowed to run off on the surface is forced to go down through the ground, the finer materials would be left in the soil, and those materials that are held in solution which the soil has a tendency to take out of solution often would be left in the soil also.

So in much of that country the indications are now, although we have not carried our investigations far enough to make it wise to indicate the commercial lines of procedure, that those lands would be very greatly improved in many cases by underdraining; that the underdraining would permit of an improvement in their textural character and allow a deeper penetration of the roots.

Our studies in Wisconsin have shown that with almost all of our crops, if the water table is in its proper place, the roots are down 4 feet in the ground. The soil of a cornfield is permeated with roots of the corn to a depth of 4 feet, so that there is not a quarter of an inch of soil, usually, in that whole 4 feet that is not penetrated by the roots, and is not contributing, without moving the salts any great distance, directly to the feeding of the crop. But in the South a repeated examination scarcely ever gave us any indication of a depth of root greater than 12 to 18 inches. Nearly all of the roots of the cotton crop, for instance, are up within the surface 8 inches of soil, and in the ridge cultivation that they practice there in the middle of the row the bulk of the roots are often not more than 6 inches below the surface. The result is that a week's dry spell or a ten-day dry spell brings those crops under the drought condition, because the soil dries out so fast that the water, although abundant down below, can not be utilized, whereas if the texture of the soil were such and the water conditions of the soil were such that the roots could be put down in the third foot and fourth foot, then the water which is below would become available and any but long drought periods would be tided over.

Representative SCOTT. Is it because of an impervious subsoil or a rocky subsoil? What is the reason the roots do not go deeper?

Mr. KING. The reason the roots do not go deeper is the lack of granulation there, in the first place, that makes it possible for the soil to hold itself too full of water. The country is quite level, too, with a small gradient, and the ground water is naturally held within 3 to 5 or 6 feet below the surface, where there is no artificial drainage. The practice of putting wide ditches on the borders of fields followed in the South does not give a lowering of the water sufficiently great to make it possible for complete drainage to take place.

Mr. Chairman, I will stop any time you indicate.

Mr. WHITNEY. Dr. Wiley is here now, and as we have finished our presentation, we will stop if you wish to have us do so.

Mr. KING. I think I have taken the half hour you thought I might occupy.

The CHAIRMAN. The members of the committee have to be on the floor of the House at 12 o'clock to-day, owing to the fact that we are going to bring up the emergency appropriation to stamp out the foot-and-mouth disease, and I do not believe we would be able to get through with Dr. Wiley in an hour. What would the committee say to meeting again at 2 o'clock and hearing Dr. Wiley at that time? Have you finished your presentation, Mr. King?

Mr. KING. I can stop here as well as anywhere, just at your pleasure.

Representative GRAFF. There is just one question I want to ask Mr. King along the line of this suggestion that there ought to be an opportunity to move the soil or do something to let air into the soil. One of the finest pastures that I ever saw I saw this summer in my district, in Beulah County, Ill., on a farm where the grass had been growing undisturbed for forty years. I thought it was the finest grass I ever saw in my life. There was a tremendous herd of cattle on it, and the grass was lying in great bunches and bending over in every direction. It looked as if they were having no effect upon it at all.

Representative ALLEN. What kind of grass was that?

Representative GRAFF. Blue grass—and I wondered what effect the continued keeping of that land in grass would have. Would it open up the soil so as to let in air?

Mr. KING. A crop that develops a close-root system in the soil, as timothy or blue grass does, has a very strong tendency toward the development of this granulated condition. You take a blue-grass sod and shake the dirt out of it, and you get a beautiful granulation of soil. The long maintenance of the absence of those conditions tends towards the coalescence of the grains, especially in wet localities or in wet seasons, and to make the soil close and to carry it out of the proper textural condition.

Representative GRAFF. This was open land that had some fall to it.

Representative ALLEN. Do you regard timothy as having any fertilizing qualities on the ground?

Mr. KING. Not so far as adding anything directly is concerned, except as it contributes humus in the decay of its roots, and as it contributes better and modified physical conditions.

STATEMENT OF DR. H. W. WILEY, CHIEF OF THE BUREAU OF CHEMISTRY, DEPARTMENT OF AGRICULTURE.

The CHAIRMAN. Doctor, in looking over your estimates of the Bureau of Chemistry, on page 15, the first item I notice is that you have submitted for a chief clerk at $1,600. What is the need for that officer, and who has been doing that work before? Give us all the information you can in your own way about him.

Dr. WILEY. We have never had anyone at all as a head to take charge of the clerical work, and since the establishment of the Bureau and the division of the work into eight or ten different laboratories the keeping track of the clerical work has become entirely too much for the Chief of the Bureau to do himself, if he devotes himself to scientific work, and it will be necessary, as in other bureaus of that description where there is a multitude of divisions in the character of the work and in the nature of the correspondence, that we should have some competent person to take charge of it. In other words, the same reason exists for the employment of a chief clerk as in the other large bureaus where a multiplicity of work is taking place. I do not know that I need to say more, except that we have a very varied correspondence, covering almost every imaginable thing.

The CHAIRMAN. Some of these bureaus have chief clerks and some have not. Forestry has no chief clerk.

Dr. WILEY. I believe all the others have.

The CHAIRMAN. Plant Industry has.

Dr. WILEY. I believe they have some one who does the work of a chief clerk in the Forestry Bureau.

The CHAIRMAN. That may be true.

Dr. WILEY. They have a forester in charge, or something of that kind. They may call it by another name, but the need for this additional clerical service is quite imperative for the good of the public service.

The CHAIRMAN. Who has been doing that work heretofore?

Dr. WILEY. I have been supervising it myself, with the assistance of one of my scientific aids, Mr. Ewell, who is my first assistant, and who should be engaged in chemical work. He has been doing the most of it. In fact, it has occupied the greater part of his time.

Representative GRAFF. What salary does he get?

Dr. WILEY. He gets $2,500.

The CHAIRMAN. So you have no clerk attending to that work now?

Dr. WILEY. No; none at all. There is a young lady there, Miss Tidd, who has supervision of the typewriting part of it, and who reads and approves all correspondence before it is submitted for my signature, but not of the other details of the clerical service.

The CHAIRMAN. Who would you make chief clerk? Would you make a man or a woman chief clerk?

Dr. WILEY. I do not know. I do not discriminate in sexes, and Miss Tidd is thoroughly competent for the place.

The CHAIRMAN. It is a matter somewhat of salary, you know. It is not thought, as a rule, women should be paid as high as men.

Dr. WILEY. For the same class of work?

The CHAIRMAN. Well, perhaps on general grounds. It is not thought, generally, that women are as valuable to the service as men. They may do the same class of service, it is true.

Representative SCOTT. Would you not have to take this clerk from the civil service?

Dr. WILEY. Yes. The lady I mention has had fourteen years experience now, and she is very capable. I do not think I could get a better person to whom to give the whole charge of the work than she is, if she could be relieved from the typewriting part.

Representative GRAFF. What salary does she get?

Dr. WILEY. She gets now $1,400.

Representative SCOTT. As a typewriter?

Dr. WILEY. Yes; as a clerk of class 2, I believe it is. Her work is partly typewriting, but also supervisory, as I have just said.

Representative GRAFF. Are there not very few clerks who do typewriting work who get that much salary?

Dr. WILEY. There are not a very large number, I believe, but there are some who do.

Representative SCOTT. If she were promoted to the chief clerkship, at a salary of $1,600, could not the remaining work which would still have to be done by a typewriter be done by a clerk on a $1,000 salary—for example, an ordinary typewriter's salary?

Dr. WILEY. I do not doubt but what it could. There is no question about that. There are many clerks who are just beginning as type-writers, at $600 or $700, who are perhaps as efficient as those who have a larger salary; but I think the spirit of the civil service is that for a long-continued service an increase should be given, and not to keep the salaries down to the minimum for which they could be secured. I do not think there is any doubt but that the clerical service which the Government gets could be done for half the sum just as well, if we put it on the basis of the ordinary commercial cutthroat system of competition. I have not the least doubt of it.

Representative SCOTT. I am not complaining about the salary which your typewriter gets now. I was merely suggesting that on account of her long experience she is already doing work that ordinarily would not be given to a typewriter.

Dr. WILEY. Yes; she does the highest class and most difficult parts of the clerical work requiring skill.

Representative SCOTT. And if you were given a chief clerk who would take all the responsible work of the Bureau in that direction you might apply to the Civil Service simply for a typewriter, supplied at the usual salary paid beginners in that line.

Representative ALLEN. Is she a stenographer?

Dr. WILEY. Yes; an expert stenographer and typewriter, and she has had, of course, the longest experience of anyone there, and understands chemistry because she has been writing on chemical work so long. She has skill beyond the ordinary skill of an ordinary clerk, but I would not like to see the other position abolished, because we have others there who have also served a long time who ought to be promoted to the vacant place.

The CHAIRMAN. She occupies the place now of a clerk at $1,400?

Dr. WILEY. One thousand four hundred dollars; yes.

The CHAIRMAN. On the statutory roll?

Dr. WILEY. On the statutory roll; yes, sir.

Representative SCOTT. Let me ask one more question in respect to this. Could you promote her to this chief clerkship, or would you be obliged to ask the Civil Service Commission for a certification?

Dr. WILEY. No; we could promote her under the rules without asking for an additional certification.

The CHAIRMAN. Turning over to your printed estimates there under the general expenses of the Bureau, I notice a little new matter. I do not care for that "telegraph and telephone service"—we understand that; but a little lower down:

> The Secretary of Agriculture, whenever he has reason to believe that articles are being imported from foreign countries, which, by reason of such adulterations, are dangerous to the health of the people of the United States, or which are forbidden to be sold or restricted in sale in the countries in which they are made or from which they are exported, or which shall be falsely labeled in any respect in regard to the place of manufacture of the contents of the package, shall make a request upon the Secretary for samples, etc.

Dr. WILEY. I think I can explain the meaning of the matter in italics there. The plain meaning of that is that what is not good enough for other people is not good enough for ours, and if countries restrict the manufacture and sale of certain classes of food products in their own countries we ought not to be the dumping ground of the adulterated articles, as we are to-day. There are a great many countries where certain food products are prohibited from manufacture or sale, or where they are made and sold under restrictions, and, in order to get an open market, these same products are dumped without question on to us. Under the present law we can exclude them if we can prove they are deleterious to health, but that might require a very long series of proof before a court. This is suggested on the principle of law and justice that——

The CHAIRMAN. It will save us an immense amount of labor, because it puts the burden of proof on them?

Dr. WILEY. It puts the burden of proof on them and relieves us of the responsibility.

The CHAIRMAN. Their Government has said that this stuff is injurious to health and must be sold under certain rules and regulations. That is enough for us. We will abide by those rules and refuse to allow it to be sold unless they prove that their stuff is unobjectionable.

Dr. WILEY. They could sell it under their own laws if they could do that.

Representative WILLIAMS. That is all right as to adulterated food; but this language, "or which shall be falsely labeled in any respect with regard to the place of manufacture of the contents of the package," does not apply to adulterated foods.

Dr. WILEY. That was put in because we have just passed a law making it a penal offense in this country to falsely brand any food product in regard to the place of its manufacture.

Representative WILLIAMS. Are you going to stop all these California fellows who are sending French and Rhine wines abroad?

The CHAIRMAN. What law do you refer to, Doctor?

Dr. WILEY. That law has already been passed by the last session of of Congress and has been signed by the President. It prohibits the false branding of any food product in this country in respect of the place of its manufacture.

Representative WILLIAMS. Then we can not export Rhine wine to Germany any more?

Dr. WILEY. That does not refer to Germany. It refers to this country. You can not sell Rhine wine in this country that is made in California.

Representative WILLIAMS. They are exporting California Rhine wine to Germany.

Dr. WILEY. We can not make laws for Germany. We can only make them for ourselves. You can not sell in this country a Rhine wine made in California.

Representative WILLIAMS. Can the Department of Agriculture stop them when they undertake to export it?

Dr. WILEY. The law is not put in the hands of the Secretary of Agriculture for execution. Nobody is appointed to execute it.

Representative WILLIAMS. Then it is a dead letter.

Dr. WILEY. It has no provision for its execution. It has a penalty.

Representative WILLIAMS. I noticed some time ago in one of the magazines a boastful article to the effect that we were sending things everywhere, and, among other things, that we were sending Rhine wine to Germany.

Representative SCOTT. Did you get the impression from that that they were presenting them as if they were manufactured abroad, or as if they were made in California?

Representative WILLIAMS. No; made in California and sold abroad as Rhine wine; not sold in Germany exclusively, but sent to other countries and sold as Rhine wine.

Dr. WILEY. I think, Mr. Williams, that is a mere boast. I do not think any bottle of Rhine wine made in this country was ever sold abroad.

Representative WILLIAMS. The Assistant Secretary of the Treasury, Mr. Vanderlip, is the author of it.

Dr. WILEY. I have a great regard for Mr. Vanderlip, but I think he is mistaken. The Germans and Europeans are very careful about not permitting falsely branded articles to be sold in their own countries. If they are branded at all, they are branded there with their names falsely, and not in this country. But the object of this new matter is simply to place food products coming into this country on the same basis upon which those made in this country are placed, not to discriminate in favor of foreign manufactures.

The CHAIRMAN. I see the point of that very forcibly. In other words, we are willing to take their government's own estimate.

Representative WILLIAMS. That will go, perhaps, further than you think. For example, they make schweitzer cheese somewhere up North. I do not know exactly where.

Representative DAHLE. That is in my district.

Representative WILLIAMS. They make schweitzer cheese right along, and it is branded "schweitzer cheese."

Dr. WILEY. With all due respect to your constituents, Mr. Dahle, I do not think they ought to do it.

Representative WILLIAMS. It is branded "Sweitzer cheese," not in English, "Swiss cheese," but "Sweitzer," and that fools everybody. By the way, it is just as good as sweitzer, too.

Representative SCOTT. Is not "Sweitzer" simply a brand, just as "Portland cement" has become a brand?

Representative WILLIAMS. The man who buys it does so under the impression that he is getting Swiss cheese made in Switzerland. It does not do him any harm; but you thought it did people immense harm to buy oleomargarine for butter, and you had better carry that principle clear through.

Representative DAHLE. The Swiss cheese is really better than our own cheese.

Representative WILLIAMS. I do not think so. I think a good deal of Swiss cheese made in this country is better than the Swiss cheese I have eaten made in Switzerland.

Representative DAHLE. A judge can tell the difference.

Dr. WILEY. I do not think the law applies to any name that is misleading, but to the country where it is made. I will say, Mr. Chairman, in regard to this law, that when it was passed the Secretary of Agriculture was applied to by a great many manufacturers in regard to certain labels which they submitted, and they asked the Secretary if those labels were in contravention of the Sherman law, which was just passed at the last session. The Secretary of Agriculture referred the matters to the Attorney-General. The Attorney-General made a ruling on the facts submitted, and the Secretary of Agriculture is answering now all communications of this kind on the basis of that ruling. Practically the law has come to the Secretary of Agriculture for administration, although it is not so stated in the act itself; but he has construed the law according to the opinion of the Attorney-General. For instance, we have had a great many cases in regard to beans and peas. One firm in Louisiana was selling a large number of peas and beans under their own label, of their own town, although they were put up in Maryland mostly, and that was one of the points which was decided, that they could not do that under that name; that they would have to leave the name off altogether. The Attorney-General decided it was not necessary to put on the package the name of any place. You could leave off all places and simply put on the name of the contents, which would not contravene any law. They could sell all the canned peas and beans they wanted to if they would not say they were put up at the wrong place. They could simply say "John Jones's canned peas."

Representative ALLEN. How about the labels "Made in Germany?'

Dr. WILEY. That is in harmony with our tariff law, which requires that imported articles as they pass through the custom-house must bear a label of the place where they are made.

Representative DAHLE. If I put up peas, I can not say that John Williams put them up?

Dr. WILEY. Yes; but you can not say he put them up in Mississippi unless he really did.

The CHAIRMAN. We have two canning factories in my county, one at Geneseo and one at Mount Morris, 6 miles above. We label them all "Made at Mount Morris." Would that be a violation of this law?

Dr. WILEY. In the same State?

The CHAIRMAN. The same State and the same county. Would that be a violation of this law?

Dr. WILEY. I think it would.

The CHAIRMAN. I will have to write them and tell them about it.

Dr. WILEY. I will say for the information of the chairman, if he is not informed in regard to this law, that it was instigated by the cheese makers of his own State, because cheese is made in Wisconsin labeled "New York full cream cheese," which had a great market in the East.

The CHAIRMAN. Let us wind up this one thing first, Doctor. The language below there, "in collaboration with the Association of Official Agricultural Chemists and such other experts as he may deem necessary, to establish standards of purity for food products," was a new item put in last year?

Dr. WILEY. We have done a great deal in that respect. The committee of the association consists of Dr. William Freer, of the State College of Pennsylvania, who is chairman; Professor Jenkins, director of the experiment station of Connecticut; Prof. H. A. Weber, professor of agricultural chemistry in the University of Ohio; Professor Scoville, director of the experiment stations of Kentucky and myself. We constitute the committee of the association on food standards. We have had several meetings under the auspices of the Secretary of Agriculture, and we have gone quite a distance. We have formulated standards for dairy products, for cereals, for tea, coffee, and chocolate, and for a number of other food products. These standards are to be gone over at another meeting of the committee which is called for the 2d of January, and then they will be ready to submit to the Secretary of Agriculture for his approval. If he approves them, under the law, they will then be issued officially. They have no legal authority. They bind nobody, as you see.

The CHAIRMAN. But they will have great weight?

Dr. WILEY. They will have weight and will do a good deal to unify legislation and court practice. This demand has come from all parts of the country: "Can't you do something to help us out, because the courts decide on this point here and on a contrary point there?"

The CHAIRMAN. Doctor, some of the members of the committee did not hear this last year. Will you just briefly describe the object of this language?

Dr. WILEY. The object is this, that if the Secretary of Agriculture, guided by these experts, formulates a standard for a food product, although it has no legal or binding effect upon the court or upon the State legislature, it will be used hereafter as a model in fashioning

State legislation, and will be used by the courts as a standard in adjusting their decisions.

Representative **Allen**. In an advisory capacity?

Dr. **Wiley**. In an advisory capacity, so that gradually there will be a uniform practice which will be of great benefit not only to the consumer but especially to the manufacturer and dealer, who often have to go through the throes of prosecution under the State laws. We have to go pretty slowly, and we have to collect thousands of analyses from all parts of the country. We have associated with us a body of expert chemists whom we call referees. They are doing for us chemical work where standards are not fixed. We bring all these together and try to arrive at something which will be reliable and at the same time will not be in a condition to work injustice upon any honest manufacturer and dealer.

Representative **Scott**. Can you give us an idea how you go about it to establish a standard of coffee?

Dr. **Wiley**. We think that coffee should be the true coffee berry; that it should be free of what we call imperfect berries—black-jack, stones, and sticks; that it shall not be coated, colored, or treated in any way to falsely improve its appearance and make it appear better than it is, and that it shall not contain any added substance, like chicory or any other coffee substitutes. That is the kind of standard we would establish. I do not quote the very language. We do not classify coffee in regard to commercial standards. We have nothing to do with that. We simply state what is a pure coffee, in the opinion of the committee, as a standard food.

Representative **Cooney**. Professor, when I buy coffee, how will I understand that? How am I going to be protected?

Dr. **Wiley**. There is one thing I forgot. We contend that coffee shall be true to name. Suppose you go down here in a store and buy, as thousands of people do, Java and Mocha coffee. Every time you do that you are defrauded. I will say, Mr. Chairman, that unless it is some private stock that somebody has obtained especially, there is not a grain of Java coffee or Mocha coffee in this town to-day, and there has not been for ten years. Every one of us is defrauded every time we buy a pound of coffee thus named, because the very best coffee which is used for making that mixture you can buy at wholesale to-day for 8 cents a pound, and it is sold to you at from 32 to 40 cents a pound under a false name, simply because people have learned to associate high qualities with the names Java and Mocha.

Representative **Scott**. Is it sold under its true name at a different price?

Dr. **Wiley**. If you would offer that as Brazilian coffee, you could not get 20 cents a pound for it.

Representative **Scott**. I mean to the consumer.

Dr. **Wiley**. They sell at lower prices, the same as any coffee.

The **Chairman**. You can not interfere with that under this law. You simply define a standard of coffee.

Dr. **Wiley**. This has nothing to do with prosecuting a man for doing it, but you go to court, and the question is asked, What is this coffee? It is not true to the name, according to the standard fixed by the Secretary of Agriculture. Therefore the court will instruct the jury to find that it is fraudulent, because it does not come up to the standard. Standard has nothing to do with the instruction of the court. It is simply an information for him.

The **Chairman**. Your protection is to go to court, as I understand it, Judge Cooney, when you have doubt as to the purity of the article, or that you are being sold something different from what it is called.

Representative COONEY. I go into court and prosecute.

Dr. WILEY. Yes; you go into court and prosecute, and you are aided in that by the standard set by the Secretary of Agriculture on the advice of these experts.

Representative COONEY. The standard is not final?

Dr. WILEY. No; the court can modify the standard in any way it pleases.

Representative ALLEN. Or disregard it altogether?

Dr. WILEY. Yes; but I consider this work of great service to agriculture and to the consumer.

Representative SCOTT. What is chicory used for except to mix with coffee?

Dr. WILEY. The tops of chicory make an excellent salad. The roots, which resemble the beet root, only they are not so large, are useful for cattle feed, but they are expensive for that purpose. I do not know that chicory is used for any other purpose than to mix with coffee.

Representative WILLIAMS. We have inaugurated the growing of chicory, and its main use is to mix with coffee?

Dr. WILEY. Yes; but it ought not to be a fraud. I believe in the use of chicory. To many people it represents coffee, and to a great many people the taste of coffee is improved by the use of chicory with it.

Representative WILLIAMS. It is in itself nutritious?

Dr. WILEY. It is nutritious and healthful and adds to the taste of coffee to some people. To them it makes the coffee better. Chicory ought to be used in such cases, but not secretly.

Representative HENRY. It gives it a strong flavor?

Dr. WILEY. It gives it a peculiar flavor which many people like.

Representative DAHLE. A party may want coffee at 15 cents. He can get a mixture of Rio coffee with chicory, which is better, for instance, than Mocha or Java would be without chicory at that price?

Dr. WILEY. It is to some tastes very much better; yes.

Representative WILLIAMS. There is an actual nutrition in chicory itself?

Dr. WILEY. Yes, sir.

Representative WILLIAMS. It is not injurious?

Dr. WILEY. It is absolutely wholesome.

Representative WILLIAMS. The only thing would be to force the dealer to let people know when chicory is in it?

Dr. WILEY. That is all.

Representative SCOTT. What kind of coffee would chicory itself make?

Dr. WILEY. It would make a coffee which would have a color and a certain aroma, and might be liked, like a cereal coffee is. It would make such a coffee as the cereal coffee would make.

Representative HENRY. I might say right there that it has been the custom with grocers and coffee grinders for half a century to make coffee entirely of chicory, but they usually call it dandelion coffee. It is of the dandelion family.

Dr. WILEY. I do not think chicory ought to be classed with these roasted cereal products or roasted coffee products. It is a misnomer and a fraud; but the substance itself is wholesome. There is no doubt of that.

Representative GRAFF. What is postum?

Dr. **Wiley.** Postum is a roasted cereal, wheat, I believe, roasted by a particular process.

The **Chairman.** That is sold as coffee, is it?

Dr. **Wiley.** It is sold as postum coffee.

Representative **Gordon.** It is sold as postum cereal.

Dr. **Wiley.** It would be perfectly honest to say it was postum or postum cereal. A great many dyspeptics have what we call coffee dyspepsia. There is a great deal of dyspepsia of that kind. The alkaloids of the coffee and the tannin act badly on a great many people's stomachs, and they become dyspeptic, and yet they want something that tastes like coffee and looks like it. So something of that kind is a blessing to a dyspeptic.

Representative **Lamb.** How about making coffee with wheat and sweet potatoes?

Dr. **Wiley.** That is the same principle as making it out of chicory, exactly.

Representative **Dahle.** Do you consider that there are many people defrauded by chicory? Is it not a fact that coffee is generally sold roasted, but not ground?

Dr. **Wiley.** Chicory is never added to the unground beans, as far as I know, but before coffee fell to the phenomenally low price it is now, because the cheaper grades of coffee are worth only 4¾ to 5 cents a pound wholesale to-day, there was a very prevalent practice in this country of molding parched cereals or other substances into the shape of the coffee bean. We have picked them out of dozens of samples which we have bought in the open market in this city, but it does not pay to make those now. You can not make them for less than 6 or 7 cents a pound, and unless the price of raw coffee would go up to 10 or 12 cents again this adulterent would not be used, but we can show you hundreds of those molded beans, some colored to imitate parched coffee and some of the natural color of the unroasted coffee bean. They were mixed in with the beans, 25 or 30 per cent of them, and the purchaser would never suspect it.

Representative **Allen.** Did you ever have occasion to examine Arbuckle's coffee in packages?

Doctor **Wiley.** Oh, yes.

Representative **Allen.** How about that?

Dr. **Wiley.** Arbuckle's coffee is made of not the lowest grade, but of medium grade Rio coffee. After roasting it is coated with a mixture of egg and sugar to preserve the aroma; but every package of Arbuckle's coffee has a correct label on it—"Coffee coated with egg and sugar," and they give the formula. There is no attempt to defraud or deceive. They have made it now for over fifty years, that one firm, and there is more of it sold than any other one brand of coffee in the country.

Representative **Allen.** What is that?

Dr. **Wiley.** Arbuckle's Ariosa. Arbuckle handles nearly a quarter of all the coffee that comes to this country.

Representative **Gordon.** They put on the egg and sugar to preserve the coffee?

Dr. **Wiley.** They put on the egg and sugar to preserve the aroma of the coffee after roasting. There is no fraud in that coffee whatever.

The **Chairman.** This work on the standards will take some years, will it not, Doctor?

Dr. **Wiley.** I suppose it will take three or four years, anyway, to go through the food products. The cost of this, gentlemen, is very small. The only charge to our fund is when these meetings are called by the Secretary of Agriculture of these gentlemen to consider these standards. I do not suppose it costs $1,000 a year, all told; but the good which comes from it is immeasurable, and I hope you will continue it.

The CHAIRMAN. The committee was very much impressed with the idea last year.

Dr. WILEY. Every country in the world now has this official standard of food products except our own, and we have it now; but until this law was passed last year we did not have it. Now we have an official standard which is going to take its place beside those in other countries. Austria has the most elaborate system. Their commission worked many years in Austria, and they issued a most elaborate Codex Austriacus, they call it, in which every food product was described in detail.

The CHAIRMAN. You might touch on the fact how the chemists of the different States differ on the question of the wholesomeness of food products.

Dr. WILEY. There is a great difference in different States in regard to standards of wholesomeness. Some States have enacted standards which I think are imperfect, and they are made binding on the courts. I think everybody ought to have the privilege of introducing evidence in regard to the character of his product and of influencing the court by the evidence. I think the standard should simply be regarded as a guide and not as legally binding and inflexible.

Representative SCOTT. Have you published any of the results of your work yet?

Dr. WILEY. No, not one; because we have only had since the 1st of July to perfect them, although the committee was working independently for two years before. For that reason we are so far advanced as we are; but the Secretary has not issued any publications under this law yet. We hope he will be able to do so early in the next year. I will say this to the committee, that when we propose a standard for a food product, if it is a manufactured product, we send it to all the prominent manufacturers before the committee finally considers it, and we ask them to submit either approval or adverse criticism. In that way we try to get in touch with the best class of manufacturers in order to formulate a standard which is perfectly just to the consumer and at the same time one which will work no injustice whatever nor embarrassment to the manufacturer. So far we have succeeded in every case, where we had differences between the manufacturers and the committee, in adjusting those matters so as to have them satisfactory to both parties.

You will, of course, understand that one of our greatest problems is on the beer question. That is one of the things we have now under consideration—a standard for beer. That has provoked more criticism, more differences of opinion, than any other standard which we have proposed, and yet I believe we are going to get together with all the great brewers, and that they will agree that the standard which we finally ask the Secretary of Agriculture to publish is acceptable.

Representative SCOTT. Is beer regarded as a food product?

Dr. WILEY. Yes, sir.

Representative WILLIAMS. The standard should be fixed with pure hops and malt.

Dr. WILEY. That is the committee's definition, that a beer is a fermented beverage made of a malted cereal to which the bitter of hops has been added. That is one of the definitions of a beer. Then we have varieties of beer under that; but that is the definition of beer, pure and simple.

Representative DAHLE. What is your object, for instance, in wanting this standard of the quality of beer? Is it to improve the beer?

Dr. WILEY. You take the legislation of the States where they prosecute the dealers in adulterated beer, and the courts have absolutely in this country nothing to guide them except the evidence of ex parte witnesses which is introduced at the time. The judge has nothing that he can refer to aside from the evidence which is brought before him. The judge in a court in one State will decide that a certain article of beer does not contravene the statute. In the next State, where they have a similar statute, an exactly contrary decision will be given, and the manufacturers who deal in both States are then placed in a quandary. They can sell in one State and they can not sell in another. That is an illustration of it.

The CHAIRMAN. Before we take up another subject, in which we would be interrupted if we should take it up, we had better take a recess now until 2 o'clock this afternoon, at which time we will hear you further, Dr. Wiley.

Dr. WILEY. I shall be very glad to be here, Mr. Chairman.

The committee (at 11.55 o'clock a. m.) took a recess until 2 o'clock p. m.

AFTER RECESS.

The subcommittee assembled at the expiration of the recess, Hon. E. S. Henry in the chair.

STATEMENT OF DR. H. W. WILEY—Resumed.

The ACTING CHAIRMAN. Dr. Wiley, we will hear you further.

Dr. WILEY. I am here, Mr. Chairman, simply to answer questions which the members may wish to ask about the work, and especially about the matter in italics in the estimates, which is new matter in the wording of the proposed bill. All the rest is simply a repetition of the act of last year.

We were speaking at the close of this morning's hearing in regard to the standards of the committee and the work of the committee. I believe that was sufficiently explained, however, to meet the questions which were asked in regard to it. I consider that work, although not an expensive piece of work at all—because these men are working without compensation, as I said before—a work of the very highest importance, because it will be, from its source, regarded with a certain degree of approbation which would not be accorded to an individual work of equal value, I may say. You understand exactly the meaning which I wish to convey—that is, approved by a great Department of the Government, a set of definitions which would have little value if given out by a private individual would receive a great deal more attention and carry a great deal more weight coming from the Department of Agriculture.

Representative SCOTT. Mr. Chairman, if Dr. Wiley has nothing more to say on that line, and there are no further questions, I should like to call his attention to the first paragraph on page 17, which provides an appropriation for investigations, "in collaboration with the Bureau of Animal Industry, of dairy products and adulterants used therein, and of the adulterated products; to determine the composition of process and other treated butters, and other chemical studies relating to dairy products, and to make all analyses of samples required for the execution of the law regulating the manufacture of process butters."

The ACTING CHAIRMAN. That is new.

Representative SCOTT. The last two lines are new. I would like to ask if that has been put in there because you have been requested to make such analyses in a general way, and in a general way what your work has shown this year in the matter of oleomargarine and adulterated and process butter.

Dr. WILEY. You of course know that the new law in regard to the oleomargarine industry and renovated butter places a part of the execution of that law in the hands of the Secretary of Agriculture, and he has assigned it to the Bureau of Animal Industry, under Major Alvord. In the prosecution of that work it is necessary to examine a great many samples chemically, because by mere inspection one is not able to tell whether the sample is genuine butter (unmelted butter) or whether it is renovated butter. I will say, first of all, that there is no part of the law relating to oleomargarine which is committed to the execution of the Secretary of Agriculture. That is all in the Internal-Revenue Department.

Representative SCOTT. I did not know but that you had been called upon to decide the question of the ingredients that should go into oleomargarine along the line of the effort that had been made to find some ingredients that would produce the butter color.

Dr. WILEY. No; we never have had any official connection with that study or that research, but we have made hundreds of analyses of samples of renovated butter, and we think we are able to distinguish in all cases—not perhaps absolutely, but with sufficient accuracy for the purposes of the courts—between a butter which has never been melted, and which therefore could not be restored, and renovated butter, a butter which has been melted, because it not only makes a certain difference in the crystalline properties found by being melted and recrystallized, but it also secures the separation of certain ingredients of natural butter which it is very difficult to replace, namely, what we call the curd and the residue that is left in the butter on churning. There is always a portion of its albuminous matter and casein matter which is left in it. In melting the butter that is nearly all removed, and even on churning again with fresh portions of milk the resulting ingredients which are not butter fat are not exactly the same as they were before. So we have a chemical difference in the constitution of these two articles. I must say in this respect the renovated butter is a purer article (in some respects), because these bodies are not necessarily constituents of butter, and their presence has a tendency to increase the danger of rancidity in fresh butter. But that is not the question we are to decide. The question is, Has this been old butter which has been remelted and reworked? There is also a difference in the physical constitution of the butter fat in regard to the "gathering" of the butter, as we say, in the churn, because when we melt a renovated butter and then divide it into small particles, either in water or in milk, it does not gather again as it did originally, or as butter which has not been melted will do.

So we decide this question microscopically by the appearance of the crystals, chemically by the changes in the albumens, and physically by its behavior when subdivided and regathered; by these three tests and by what we call the boiling test. By boiling in a vessel we find that the foam which comes on genuine butter in large bubbles and remains unbroken for a long while, in oleomargarine and in melted butter bubbles break quickly and never gather in any considerable quantity. So that we believe we are able in almost all cases—we may say in all cases, practically—to distinguish between the butter unmelted and the melted butter.

Just now we have our first case of prosecution under the law. One of the experts of my Bureau has gone to Buffalo as a witness in the first trial the Government has brought for an infringement of this law in regard to renovated butter.

The ACTING CHAIRMAN. Is it a prosecution of a retail dealer?

Dr. WILEY. I do not know whether it is a retail dealer or a wholesale dealer, because that information is not communicated to us by the Bureau of Animal Industry. We simply get the samples under their number, and we have to give the testimony before the court which will convict or clear the accused party.

This new matter was put in here at my suggestion to the Secretary, and also with his approval, in order that there might be no excuse whatever for creating an additional chemical laboratory for the purpose of executing this law.

The ACTING CHAIRMAN. That is the reason that this additional paragraph in italics was put in?

Dr. WILEY. Yes.

The ACTING CHAIRMAN. It was put in simply to give you additional power under the law of last July?

Dr. WILEY. Yes, sir.

Representative SCOTT. I judge, then, there have not been many attempts to evade the provisions of this law.

Dr. WILEY. This seems to be the first one we have found out; that is, that the officials of the Department have found out.

The ACTING CHAIRMAN. You do not know what the name of that dealer was?

Dr. WILEY. No; because we are only consulted with regard to these chemical facts. These butters come to us by number. We do not even know who makes them. We are only to decide whether they are renovated butters or not. If we find they are, and that they have been made contrary to law, we appear as witnesses in the courts.

Representative WILLIAMS. I want to ask you about another clause—this clause "to investigate, determine, and report the proper treatment and process in order to secure uniform grade and quality of first-class marketable table sirup." I wish you would tell me of the stations you have established and where and what work has been done at them, and with what result, because this was in the last appropriation bill.

Dr. WILEY. I have that in view, and I have brought some documents relating to it. I will be pleased to take it up now.

The question of investigation which has just been mentioned was undertaken at the request, first, of citizens of Georgia, but it applies to a good many of our Southern States. From time immemorial it has been the custom among the smaller farmers in those localities to make their own family molasses or sirup, and it is a most excellent article of diet, and wholesome.

Representative LAMB. Do you mean sorghum?

Dr. WILEY. No, sir; it is made of sugar cane. It is far enough South for the sugar cane to grow. This authority here to investigate does not exclude sorghum and other sirup-making plants, and we have made a number of investigations in that line also; but it was particularly in regard to the sugar-cane industry that it was put in, so we have devoted our time and attention chiefly to the making of table sirup from the real sugar cane in the South. We have proceeded in this way: If you gentlemen will look at the first report which was made [indicating Bulletin 70, Bureau of Chemistry], independent of this authority, because it was made before the bill was passed, but on our general authority, you will find the publication of the data which we secured last year; the work of this year is not finished yet in many places down there. These data will appear later, but I will explain what they are. This is the preliminary report, the results of which were deemed sufficiently important to induce the Secretary of Agriculture to ask for the special appropriation.

Our object, in the first place, was to find if that sirup was subject to adulteration when sent to other markets; second, to determine some of the methods which would improve its character and keeping qualities; and, third, incidentally to study the plant itself from which the sirup was made, with the idea of improving its sirup-making properties, by cultivation, fertilization, and otherwise; and all these problems we have undertaken during the past season.

The most of our work has been done in the State of Georgia, but we have agents also in Alabama and in Florida, in Mississippi and in this city. We have not established these agents at any particular place. They are men who were recommended to us by the agricultural experiment stations of the several States as competent to secure samples and make the necessary investigations. They nearly all have had chemical training, but we did not establish any laboratories. All these samples were simply taken under the supervision of these men at the various places, and were preserved in accordance with our instructions and sent in mailing cases to the laboratory at Washington for examination. This saved a good deal of expense.

Our object was to study the effect of the rich sugar canes upon the crystallizing properties of the sirup. The tendency to crystallization is one of the great difficulties in marketing sugar-cane sirup in south Georgia and the other States I have mentioned. These canes, strange to say, are remarkably rich in sugar, and although they are boiled in open kettles and a good deal of that sugar is converted during the process of boiling, yet the makers have the greatest difficulty in securing a sirup which will not granulate, because if it granulates it is useless for sirup purposes. We did not want to put any adulterant in it to keep it from granulating, but we found we must use something which during the boiling would convert more of the sugar. So we decided to use an acid which is already present in the natural juices—namely, citric acid—which is one of the constituents of the natural cane, and we found that by adding citric acid to the juice in moderate quantity and then boiling it with this acid in it, we would convert enough of the sugar during the ordinary process of boiling to prevent the crystallization; that is, none has crystallized yet. We are keeping it, of course; but we tell by analysis that the crystallizing element has been diminished in quantity. At the same time, when you convert this into the other form of sugar (noncrystallizing), it is just as sweet and just as palatable and nutritious as if it were the crystallizable variety. So we do not injure the sirup in any way for nutritious purposes. In fact, we improve its appearance in this way.

The ACTING CHAIRMAN. It is the old-fashioned molasses we used to get from New Orleans, is it not?

Dr. WILEY. It is hardly that, because the old-fashioned molasses, the New Orleans molasses, which was so excellent, was made by boiling the juice in open kettles, allowing the sugar to crystallize, and then putting it in hogsheads with holes bored in them and letting the molasses drain out. That was New Orleans molasses, which was so famous an article of diet in the years gone by.

Representative SCOTT. Do they make any of it now?

Dr. WILEY. Practically none, because they have introduced these new systems of making sugar, which leave molasses which is not fit to eat.

Representative LAMB. You say it is not fit to eat?

Dr. WILEY. It really is not, judged by the old-fashioned methods. I can bring to the committee samples to show what we have done. This molasses we have spoken of is of most excellent quality; but another difficulty was the fermentation. Of course, we have only one method to prevent that, and that is to sterilize and keep in air-tight cans. That is the only way to prevent fermentation. But they now can up very thin molasses, which if left open would ferment at the very first warm weather that came. That has been put in cans, sterilized, and set aside. We will open these cans from time to time. Meanwhile we will put up the same molasses without sterilizing, and that is certain to ferment sooner or later.

Representative LAMB. How do you sterilize it, Doctor?

Dr. WILEY. By heat. It is hot when it is finished, and if you put it hot into a hot tin can and seal it up at once, it is self sterilized.

Representative LAMB. On the same principle that fruit is canned?

Dr. WILEY. Yes; but if you let it cool and then put it in the cans the ferments have dropped in, and as soon as there is any warm weather they begin to work. Those are the two things the smaller dealers throughout the South have had to contend with; first the sirup is found crystallized, so that it can not be sold, and, second, the warm weather comes and spoils it.

We have devoted our attention mainly to those two problems, but we have worked also on the lines of getting better clarification and better-tasting sirup. We conducted most of that work at Guyton, Ga. There we had the use of the mill and factory of Mr. Wells, simply paying him the necessary expenses of using it, and we have done some work on our own account, and we are still working there. We will not finish there until about Christmas. The cane is now put down in windrows, on which, after his crop is all off, we propose to conduct some further experiments. Mr. Rodenberry, near Cairo, Ga., without any expense to the Department except the little supervision we have given him this fall in harvesting and weighing of his cane, undertook to grow a number of plats of cane under formulæ which we gave him with different fertilizers for the purpose of determining which one would give the best results, and with some very remarkable results. I have standing in the office canes that are 9 feet in the clear, that is, with colored joints, grown in this way, and at the rate of 40 tons of canes to the acre. Captain Purse, of Savannah, is one of our special agents down there. Here is a picture of some of the cane he sent me. He is a man about 5 feet 7, and the cane is enough in the clear there to make it full 9 feet.

Another thing which was remarkable in this examination, which I could scarcely have believed unless I had seen the data and supervised the getting of them, is the fact that this sugar cane is remarkably rich in sugar. I am very familiar with Louisiana cane. I have conducted experiments in Louisiana for the Department of Agriculture for six or eight years, and in that time obtained average analyses of their cane juices for different seasons; and the average content of sugar in Louisiana cane is not above 12, taking it from year to year. This may have been an exceptional year last year, but we have data in that book of averages for whole counties in Georgia and other parts of the South of 13 and 14 per cent of sugar in this cane, which is most remarkable, and they say it is no unusual crop. We have not collated our data for this year, but those I have looked over at random are equally as good for the present year. So I am inclined to believe that they do grow a very rich cane there, and I think one of the reasons is the character of the soil. We have samples of the soil and subsoil at all the places where we have experimented. It is almost pure sand, and it is a rapidly maturing soil, so the cane really gets riper than it does in the rich alluvium of Louisiana.

This work promises to be of immense value, and you will be surprised to know that the railroads in the South have applied for 15,000 copies of this bulletin to distribute along their lines. The Secretary, I think, has authorized the publication. Although this was only issued in a small edition of 3,000, he has authorized the publication of enough of these bulletins to distribute among the people there, because it gives promise of encouraging an industry which will develop not only the agriculture in those regions, but, secondarily of course, be a benefit to the common carriers hauling this material when it is well known to all the markets of the world.

Representative GRAFF. And it will give the people a wholesome food?

Dr. WILEY. A most wholesome and most delicious breakfast food and condiment.

Representative WILLIAMS. In that connection, in my county we raise two kinds of cane. They are very rich in saccharine matter, and they are a very sure crop unless the frost comes particularly early. In a year like this they make a magnificent crop, because the frost came very late. We have very little difficulty in growing that cane, but the trouble we have is saving it for the next planting. It is more expensive to do that than in Louisiana, because we have severer winters, but none of us have been able to make sugar. It has not been tried on any very large scale, you understand, but upon a small scale we can not make sugar.

Dr. WILEY. Out of the cane?

Representative WILLIAMS. Yes. We get the finest sirup in the world—better than the Louisiana sirup.

Dr. WILEY. Are not your people troubled with the sirup crystallizing, as they are in Georgia?

Representative WILLIAMS. Oh, yes; our people bring it up in small quantities and sell it to the local market. They send it to St. Louis in little kegs, and we have had all these troubles of which you speak, souring and fermentation, and crystallization, too. That does not particularly hurt, except that it leaves a deposit of brown sugar at the bottom. I do not think that makes much difference, except that there is less sirup. But why is it we can not make sugar there just as well as they can in Louisiana?

Dr. WILEY. Of course sugar making requires the evaporation to take place in a vacuum, because the heat always converts a certain quantity of the sugar, otherwise it would solidify at once, the moment it was boiled. That is the chief reason. If you put that sirup into a vacuum apparatus, where it can be boiled at a low temperature, you would make magnificent sugar out of it. That is the only reason. In the old-fashioned days in Louisiana, when they boiled in the open kettle, the average yield of sugar per ton was 70 pounds. To-day it is 160 pounds. They simply did not get the sugar when they boiled.

Representative WILLIAMS. You think we could make it, do you?

Dr. WILEY. Absolutely.

Representative WILLIAMS. I do not know that it has been tried lately, but the planters formerly tried it.

Dr. WILEY. What I said to the people down there was, "If you make sugar you have a less valuable product than your sirup, because that is worth more." You have a very short season. You have said the frost shortens the season. Therefore stick to sirup, because that you have a profit in. If you make sugar you have got to run against the most expensive machinery and the highest science in the world, and you are going to lose money.

Representative WILLIAMS. I buy all my table sirup from the farmers in little gallon jugs, so that there is not much chance of it souring before it is used. It is undoubtedly the most delicious table sirup in the world.

Dr. WILEY. You will find this about the sirup: I was brought up in a region where they had what was called "sugar camps." They call them "maple bushes" in New England, but in southern Indiana they are called "sugar camps." Nearly every farmer along the Ohio River made his own maple sirup and maple sugar, and in the spring when we first made it we thought it was the best stuff in the world. In a week or two everybody got tired of it. Nobody wants to eat maple sirup every day for a long period. But I ate this molasses all last winter almost every morning, and I liked it better the last day than the first. It is a taste that grows on one. You do not get tired of it.

Representative SCOTT. It is thicker than the maple sirup, is it not?

Dr. WILEY. It is usually boiled somewhat thicker, but that is a mere matter of boiling. The same is true with sorghum sirup. You do not get tired of it as you do of maple sirup.

Representative WILLIAMS. Is not that because of that acid that is in the maple sirup?

Dr. WILEY. It is the peculiar flavoring matter and taste that you get tired of.

Representative SCOTT. Have you designated in this bulletin where we can get some of that sirup?

Dr. WILEY. Yes; I have designated it. I am going to furnish the committee some of it as soon as it comes.

Representative SCOTT. Where can it be bought?

Dr. WILEY. You can get it in Savannah. Cairo is the biggest market for it. They send out about 32,000 barrels a year from that small town.

Representative WILLIAMS. Have you any advice to give about the sort of package to put it in?

Dr. WILEY. I will tell you what I have advised them as a result of our experiments. In the first place, they often use second-hand barrels which are full of ferments, to begin with. That is fatal at the start. I have given them these instructions this year as a result of our preliminary experiments. It makes no difference whether the barrels are old or new, the first thing is to fill them with boiling water, or if they have steam, to put a steam jet right in and steam the barrel until all the ferments are killed. Clean the barrel thoroughly and then burn sulphur in the barrel and let it burn as long as there is air enough to burn it. That sulphur fume will sink into the wood and reach the germs which the heat has not reached and paralyze them. We put up

4 barrels of just medium molasses, such as would certainly spoil in warm weather put up in the old way. We took 2 second-hand barrels and put sirup in them, just as the farmers did down there. Then we took 2 second-hand barrels and treated them as I have suggested. Those 4 barrels are now on their way to Washington. They will be put up in a moderately warm room and watched, and just as certain as I stand here, the first warm weather that comes, if not before, the 2 barrels not treated will begin to ferment, and I believe the 2 barrels we have treated will keep away into the summer, or probably all through the summer.

Representative WILLIAMS. Our people began at one time putting up sirup in 1 gallon and 2 gallon kegs. The idea of that was that it would be in small enough packages for family use, and could be used before it would ferment.

Of course, where you have the sirup in small packages you use them up before fermentation begins. I think all those difficulties can be overcome in a commercial way.

How much of the money we gave you last year did you use in those experiments?

Dr. WILEY. We used every cent you gave us for this purpose. We asked for $20,000. You gave us $10,000 and said we might use $20,000, that is, if we would take the $10,000 from our other work, which we could not do, but we have used all of the $10,000 in this work.

The CHAIRMAN (Mr. WADSWORTH). You asked this year for $8,500?

Dr. WILEY. We asked last year for $20,000 separate from this appropriation after our other estimates came in. The committee gave us $10,000; but they put in the act that we might use $20,000 or so much as might be necessary. We have used simply the $10,000.

Representative WILLIAMS. Doctor, how much will you need this year?

Dr. WILEY. These estimates were made in August, and I had thought that we might be able to finish up the work this year and do everything we wanted. There is a general demand down there, and I believe it would be productive of immense good if the Department would build a model little sirup factory to show the people how to do it. Our whole trouble this year was working with an old factory. The proprietor was courtesy itself. He gave us every opportunity, but whenever we worked we knew that we were interfering with his work and his crop, and so we did not do as much as we would have done. Dr. Spencer, who is our expert, has just written me a report from down there, in which he says, "By all means, if we can put up an experimental factory somewhere down there that the people can see, and that will be theoretically and practically as perfect as can be, let us do it."

The CHAIRMAN. What is your estimate of expense there?

Dr. WILEY. We have not put anything at all in for this.

The CHAIRMAN. Is that included in your $80,000, that proposition?

Dr. WILEY. No, sir; when that was made up, we had not asked for anything special, because we hoped to do all the work authorized and satisfactorily with the money already given. I have not spoken to the Secretary about this at all. I only got the letter a day or two ago. We have made no special estimate. Of course the Members and Senators from all that region are anxious to have it. We may ask for a supplemental estimate in the Senate of a sum sufficient to put that up.

Representative SCOTT. How much would such a factory cost?

Dr. WILEY. A factory such as we want, I should think, could be put up and operated for a year for $15,000. I can build a good factory, with every improvement, for $7,500. It could be sold afterwards. Of course the Government would not get the full benefit of it. There would be a great demand for it right away.

Representative WILLIAMS. You would want about $15,000 for that and for the operation?

Dr. WILEY. And for the operation, if you think it wise to do that. I have not spoken to the Secretary about this because I have not had a chance since I got this final report.

Representative LAMB. Have you had occasion to experiment with the sorghum that is made in Virginia?

Dr. WILEY. Yes, sir.

Representative LAMB. I would like to hear you on that.

Dr. WILEY. I will state that we have not confined our work to the sugar cane, but we have had agents studying the manufacture of sirup from sorghum.

Representative WILLIAMS. One word before you go on with that. I hope you will send in that supplemental suggestion just as soon as you can, because before we report this bill I want to move the insertion of it in this committee.

Dr. WILEY. I am sure the Secretary will approve of it and I can send it in right away. I believe it would be money well spent, and we could get a good part of the cost of it back again. Of course that would go back into the Treasury, but it is a small item and would do an immense amount of good to the people down there. They appreciate our work.

Representative WILLIAMS. In that connection, I want to make this statement: I knew of an experiment being made in Yazoo County. A man there, who cultivated land and raised about a third of a bale of cotton a year, worth, at 10 cents, $12.50 or $15, made 150 gallons of the finest sirup you ever saw in your life upon an acre of just that sort of land, without any fertilization, just cultivating it as he ordinarily cultivated the cotton. The sirup is worth every year, the lowest I ever knew it, 25 cents a gallon. Very frequently it brings 50 or 75 cents. You can send it to the city and sell it to the hotels as a fancy sirup, but it is never worth less than 25 cents a gallon in the market there. So you can see the immense difference. But before you could send it out—the cheapest of it, you understand—a great part of it would be fermented.

Dr. WILEY. That is the great trouble with it.

Representative WILLIAMS. That just illustrates the immense importance of those experiments to those people. That is a section of the country which has ruined itself raising cotton, and it must necessarily go out of the cotton business. With the sandy soils there they can not compete with our heavy soils farther west.

Representative ALLEN. Why could not that sirup be bottled, under seal?

Dr. WILEY. That is what I have suggested. If you put it up hot and seal it hot it is perfectly safe.

Representative ALLEN. I was told by a member from Georgia last winter that they save all the beer bottles and send them out to the farmers, and they preserve the sirup in that way and send it into the town.

Dr. WILEY. Because the molasses as it comes from the factory is so hot that it will sterilize itself; but the unfortunate thing is, they usually collect a quantity of it and bottle it cold. That is where the difficulty is. I will say that we ran up against our old friend again in Georgia this year—the adulteration of this sirup. The very moment a thing gets worth something somebody wants to adulterate it. We found one place down there where they had imported a large quantity of glucose and were mixing it. It makes the sirup look better, and they get a higher price on the market for it. I have no objection to that kind of mixing, if it is marked, but they were selling that for pure Georgia sirup, and of course defrauding the honest maker of the difference in price between the glucose and the sirup itself as the result of this. I got a telegram yesterday saying that the Georgia legislature had unanimously passed a bill regulating such traffic in the State of Georgia and prohibiting under heavy penalties the mixing of glucose with molasses and selling it as Georgia sirup or by any other name except what it is. Of course that does not apply to sirup which goes out of the State. That can only be covered by the bill which is now pending in the House, the pure-food bill, which would regulate interstate commerce in adulterated goods of this kind.

These are some of the problems which we have come up against in this work and which we have worked out to the best of our ability this season. We have some interesting data that will be published in another bulletin as soon as we can get them ready. We have already made some several hundred analyses from the South this year, and of course have accumulated a lot of very interesting material.

Now I want to continue about the sorghum. We also have been studying the same problem in connection with sorghum. Sorghum has a considerable handicap to begin with. It does not make as good a product naturally as the sugar cane. It has not such a pleasant flavor, and it does not make as clear an article. As far as nutritious properties are concerned, there is no difference between them. Sorghum is just as nutritious and just as wholesome as the sirup from the sugar cane. Sorghum has one advantage. It does not tend to crystallize, as all of us know who worked so hard for so many years to make a commercial sugar out of sorghum. We could make sugar in great quantity, but not as cheap as they could from sugar cane and beets, and so we had to give that up. Sorghum is a plant which has a most wonderful distribution. It will grow in every State in this Union. It grows and makes a splendid crop in Minnesota, and it grows as far south as you can go in this country. It is a crop of wide distribution. As a forage crop in regions which have a tendency to be dry it is without equal. There is no other crop which will grow so much cattle feed on the same grounds surely every year as sorghum will.

Representative ALLEN. I would like to add right there that I experimented with it on my farm. I had a man plant about 5 acres in sorghum, and it was the most vigorous growth I ever saw. He cut it and chopped it in the fall before it got ripe or dry, and I have never seen such a magnificent lot of cattle forage as that was. The food was all eaten up clean and contributed very much to the healthfulness and fat of the cattle.

Representative COONEY. In what condition did it leave the ground afterwards?

Representative ALLEN. Just like any other corn.

Dr. WILEY. Of course, any crop that is worth having exhausts the ground. You can not grow a crop that does not take material from the soil.

Representative GRAFF. It grows better on land that is quite dry.

Dr. WILEY. I once called sorghum the camel among cereals, because it seemed to be able to carry enough water to last it over a dry season. I have seen in Kansas especially, where I spent several years, fine fields of sorghum growing, when the indian corn, side by side, was almost a total failure. It has the ability to extend its roots deep into the soil and get hold of the moisture that the indian corn does not have. That makes it particularly valuable for the semiarid regions. The farmer who has plenty of sorghum in a dry season has something sure to build on. You would be surprised to see how widely the sorghum-sirup industry is distributed in this country; not so much as it was a few years ago, because during our civil war, when I was a boy, almost everybody in our country had a factory. The only source of sugar they had was the sorghum. But it is very prevalent now, and makes a splendid article. We sent an agent from the agricultural college of the University of Minnesota to one of the principal factories in Minnesota, that makes the best sorghum made in the United States, not even excepting your State of Kansas. He has studied there this problem of preservation and purification, the same as I have just described, and sent his samples on. We also had a man from the Agricultural College of Kansas to spend his time between two places in Kansas—Iola and Fort Scott—where they had factories run on different principles, the one at Iola being an old-fashioned mill, and the one at Fort Scott being the diffusion process. We have studied those two processes in Kansas from the same point of view.

The Department has for years conducted similar experiments in Kansas, through our special agent, Mr. Denton, who has devoted his whole life to this problem, and he has devised some excellent processes for clarifying the juice. Almost the whole problem of sorghum-sirup making is clarification. What we want is a bright and clear and good color. Then the sorghum will stand up in the market and find its way and keep it. Of course, it has had to contend with artificial substitutes. This country is flooded with table sirups that are absolutely artificial; that is, they are not directly extracted from any sugar-producing plant, but are made from glucose, flavored with the residue of a sugar refinery. That is most of our table sirup to-day. As long as that has free course in our market any genuine article of table sirup, whether it is made from sorghum, maple, or sugar cane, will have to be slighted in the market; but people are willing to pay more when they realize the excellence of the quality. What we want is to establish an honest market for those products down South, so that when farmers do make them in quantities more than they want to consume themselves, they will find a market which is not overstocked with a cheaper article or imitation.

Those are the objects we have in view in the work we have done and in the supplemental estimates, which we hope will come before you before it is too late.

The CHAIRMAN. Doctor, if you are through with that and there are no more questions, what have you to say to the proposition, "To study, in collaboration with the office of public road inquiries, the chemical and physical composition of materials used for road, street, and bridge building, to ascertain the fitness thereof for the purpose intended, and to suggest the best and most economical methods of their utilization?" That is a new proposition.

Dr. WILEY. I want to explain that.

The CHAIRMAN. And also this matter of the Bureau of Forestry?

Dr. WILEY. Yes. I will tell you what we have been doing for several years in the study of roads. It is not a question of engineering to throw a lot of dirt together and cover it with something. That is not road building. You have got to make the surface of a road of something which will last, something which has the properties of holding together. The object of establishing this road-material laboratory was to study the materials which are used in building roads—in regard to their fitness for that purpose.

The illustration, which is a very common one, is this, one that came under the notice of our expert in Massachusetts. They built an expensive road costing twelve or fifteen thousand dollars a mile, and covered it with stone, and when the traffic commenced to go on it, every time it rained, or when the wind blew, it left the stone bare. They used a stone which had no cementing properties at all, and was utterly unfit for making the surface of the road, though it would have been a good material to put underneath. The result was that they had to go to the expense of resurfacing that road with a material which, when ground together, would hold. We can tell you before you put a cent into a road whether the stuff you surface that road with is going to make a good surface or not. We have physical and chemical tests by which the fitness of the material for road building can be determined.

In addition to that we have built machines for testing the strength of bricks which are used in making roads and for timbers which are used in making bridges, so that before you begin you know the quality of every material which goes into the road. After we have done this, then comes the time for the engineer to lay out the road and grade it. We tell him what to put on it. I believe this information which we are now getting ready for publication—the principles of it—will be of immense advantage to our country, because one of the chief things which agriculture needs in this country to-day is good roads to reach markets.

Representative ALLEN. I wish to ask you if you have ever had any experience with gravel. There is a gravel in the southern part of Kentucky known as "Paducah gravel" that you can put on the top of the road beds and it will absolutely cement itself. You can take it up in great chunks.

Dr. WILEY. I do not know that I have had any experience with that; but such a bed of gravel is a blessing to any community. If you have the stone underneath to hold the base and the cementing material above, you have an ideal road.

I will tell you how that has been conducted for the past three years. The Secretary has simply set apart a part of the appropriation for good roads to be used in my Bureau for the conduct of this laboratory, and that has been in some respects entirely satisfactory. This italicized part was put in here to bring to the attention of the committee the advisability of considering the making of this appropriation directly to the Bureau of Chemistry, so as to make the administration of it more simple. We get from the road-material fund about $10,000 a year to conduct this laboratory.

The CHAIRMAN. This work has really been going on there, has it?

Dr. WILEY. Yes; for three years. This fund now is assigned by executive order from the Secretary, and belongs to the Bureau of Chemistry by courtesy.

The CHAIRMAN. How much money do you get?

Dr. WILEY. We get about $10,000 a year.

The CHAIRMAN. Out of the $30,000.

Dr. WILEY. Out of the $30,000; yes, sir. That is what we are getting now. We do the same thing with the Forestry Division. They assigned us this year about $12,800 of their funds to carry on the laboratory of dendro-chemistry, where we investigate all the problems of a chemical nature relating to the manufacture of wood pulp, the production of tannin, the chemical utilization of tanning materials, the production of gums and resins, the use of forest products for any technical purpose whatever, such as the making of wood alcohol, the making of charcoal, wood tar, acetone, and all chemical products that are made from the destructive distillation of wood. All technical purposes to which wood is put, aside from building material and ordinary combustion, are investigated in this Bureau, and we believe we are doing a great work for economic forestry, especially in tanning materials, a great deal of which are wasted. An oak tree is cut down and parts of it are thrown away. We can show you that you can use the whole of the tree. You can grind it up and extract the tannin. We are every year throwing away thousands of tons of valuable material which can be economically saved and applied in some other way than in making paper pulp. We want to investigate materials which can supply an additional amount of paper, so that our forests will not be entirely destroyed for the making of paper.

Representative ALLEN. Doctor, have you made any experiments in extracting alcohol from the beech wood?

Dr. WILEY. You understand, of course, that alcohol does not exist in wood as it grows. It is only when you heat it that the alcohol is formed; but varying amounts of wood alcohol can be obtained from various kinds of wood, beech among others.

Representative SCOTT. Do you mean to say that oak trees can be ground up and the tannin made available in competition with the tannin from the bark of the same trees?

Dr. WILEY. In the forests I have in mind you would find whole trees lying there to rot.

Representative SCOTT. I understand; but as long as the bark can be secured, can not the tannin be obtained from the bark so much more cheaply that it would be impossible to use the body of the tree in competition with it?

Dr. WILEY. That would be true if we had inexhaustible forests; but the price of bark is going up all the time. The bark of an oak tree will have 6 to 8 per cent of tannin in it. The wood may have less. You have to grind that up and make a tannin extract. We are importing thousands of tons of tannin from other countries to-day. Our tanning materials are going very fast. This is an important study of an economic and scientific nature, and most interesting scientific data are obtained in regard to the distribution of tannin.

Representative WILLIAMS. They are using the wood as well as the bark in Virginia, are they not?

Dr. WILEY. Yes. At Buena Vista there is a very large factory that uses the wood and makes an extract, and we are studying the subject of tannin in the oaks in all parts of the country to show that it would pay to extract it in this way. There are also factories at Damascus, Extract, Rio, and Brandywine, W. Va., and Apalachia, N. C.

Representative SCOTT. Was this work that Mr. Williams speaks of begun before your investigations?

Dr. WILEY. Yes; some of it. It has been well known that a certain variety of oak (chestnut) has enough tannin to pay for working it up, but nobody knows how far that extends, because the other varieties have not been investigated.

Representative WILLIAMS. Is that the hemlock?

Dr. WILEY. Yes; that is the one that has more tannin in the bark than any other. Chestnut has more in the wood. I believe this work is of great economic importance, and this part in italics is suggested, in case you should prefer, as I think would be better in both cases, to take that amount from the forestry appropriation and give it to us, instead of having it assigned as it is now by executive order after the appropriation is made. It simplifies the administration. There is perfect harmony between the two bureaus in this matter. They are both as much interested in this as we are. It is only a question of administration, and it is submitted for your consideration. The work will go on whether it is given to us directly or not.

Representative COONEY. Doctor, to go back one step, how long have you been investigating the subject of material for binding roads?

Dr. WILEY. About eighteen months.

Representative COONEY. Is it satisfactory to yourself?

Dr. WILEY. We are more than pleased with the discoveries we have made already.

Representative COONEY. And with the cheapness also?

Dr. WILEY. I will give you one instance. We have found, in investigating certain clays, that by burning them they become an excellent cementing material.

Representative COONEY. That is what I wanted to ask.

Dr. WILEY. So that in countries where there is no sand and no gravel, but plenty of clay, you could make a surface on a road which would be very serviceable by simply burning the clay if you had cheap, natural fuel like forests or coal.

Representative COONEY. There is a clay that is called gumbo that is being used. Have you had anything to do with that?

Dr. WILEY. Oh, yes. You know the trouble with clay is its plasticity. As soon as it gets wet it sticks to everything. The burning destroys that property.

Representative WILLIAMS. How do you burn it?

Dr. WILEY. In the laboratory we simply put it in an ordinary furnace.

Representative WILLIAMS. How do you burn it for road building?

Dr. WILEY. We have not tried that, but one of these portable furnaces you see everywhere can be used for that purpose.

Representative COONEY. It is burned into rocks, you might say.

Dr. WILEY. Yes; the burning destroys its plasticity. In a great many sandy regions of the South you could burn clay mixed with sand, and you could get a splendid surface for a road that would last the year around, winter and summer.

The CHAIRMAN. Is that $1,000 included in your estimate of increase?

Dr. WILEY. No; that is not in our estimate. Those estimates are for our usual work.

The CHAIRMAN. That item of collaboration with the office of Public Road Inquiries is included here.

Dr. WILEY. As a part of our appropriation?

The CHAIRMAN. Yes.

Dr. WILEY. I did not submit it that way. I did not notice it after it was printed, but I submitted it as a separate item.

The CHAIRMAN. You want practically $20,000 increase?

Dr. WILEY. No; we do not express it in that way. We will get it anyway from the other Bureaus, but if you think it best to take it from those estimates and put it here, it makes no difference in the total sum appropriated for the Department.

The CHAIRMAN. How much do you get from the Bureau of Forestry?

Dr. WILEY. We get about $12,800 and about $10,000 from the Roads

Division. We have got two big laboratories there. You would be surprised to see the magnitude of the work we are doing there.

Representative HENRY. I want to ask just a question right here. I was unfortunately called out just as you were approaching this matter of road material. You say burnt clay will act as a binder?

Dr. WILEY. Yes, sir.

Representative HENRY. What would you advise in localities where clay does not exist?

Dr. WILEY. If you have no road materials at all, you are in a bad condition.

Representative HENRY. There are localities and sections where there is practically no clay.

Dr. WILEY. You nearly always find clay near the surface, if it is not on the surface, almost everywhere.

Representative HENRY. At the place where I live there is no clay within miles. I did not know what you would advise in such a locality.

Dr. WILEY. We could not advise anything unless we could get some of the materials there and study them.

Representative HENRY. Would sand alone do for a binder?

Dr. WILEY. No, sir.

Representative HENRY. I noticed in one locality they were using a sandy loam for a binder on top, mixed in with fine ground traprock. They were mixing in some fine loam, and I stopped and asked what they were doing. They said they were using it for a binder. I doubt very much whether it makes a good binder.

The CHAIRMAN. If we strike out those two items and leave the bill just as it was last year——

Dr. WILEY. It would be perfectly satisfactory to us. There is perfect harmony in this matter. It is simply a question of administration.

Representative WILLIAMS. Before Dr. Wiley goes, my friend from Missouri here has expressed a desire to know something about the Government boarding house.

Dr. WILEY. That is something I will tell you in a few words—what we are doing under your authority to study the effect of preservatives and other foods upon the health of the consumer. One of the great questions of food adulteration has been for years in regard to preservatives, and the most divergent views are held in regard to these matters—not only divergent from a scientific point of view, but also from an international and diplomatic point of view. The time has come now when somebody has got to make a final decision in regard to these matters. The days of mere opinion have passed, and so we asked you last year for authority, which you gave, to make this study.

I will tell you what we are doing. We have twelve young men who have volunteered for this purpose, and the experiment is now going on. They are subjected to the most careful medical and physical tests. They are fed by weight, and the character of every food which they eat is determined by actual analysis, not of that kind of food alone, but of a portion of that very food. As we serve the meat, for instance, to these young men we take a sample of the same meat which we serve and put it aside for analysis. We weigh each portion of the meat they receive. When the analysis is computed we compute the amount of nourishment they receive in that meat.

We have these young men divided into two classes. One we call the relaxation class, the other the observation class. We put the young men who are under observation upon a diet, as I have said. We take their temperature three times a day with a delicate standardized thermometer. The number of pulse beats is determined three times a day at stated intervals and the number of respirations. All their urine and fæces are carefully collected, weighed, and analyzed. We open an account as you would with a bank, and we keep an account with each one of them on exactly the same principle. Each man is charged with everything that goes into him, and he is credited with everything that comes out of him, and at the end of the observation if it balances it shows his functions are normal if we strike an exact balance. If there is any disturbance that comes from any cause, incidental illness or from what we give him, we know that something is wrong. We secure these balances in a period of about ten days.

Representative SCOTT. You do not mean to say that the same weight of materials comes from the man as you give him?

Dr. WILEY. Not at all.

Representative SCOTT. What do you mean, then, by saying that a balance is struck?

Dr. WILEY. There are three elements that always pass through the body unchanged in quantity. They are nitrogen, sulphur, and phosphorous. Those are the things we strike the balance on. We can not do that on carbo-hydrates and things that are burned up to furnish energy and heat. Those are all used up, but all the nitrogen that goes into him comes out in his fæces or his urine. We have got to make that balance exactly in every case. If one of these men should eat a single piece of bread that we do not give him he would eliminate in his fæces or in his urea more nitrogen and sulphur than we have given him. They are not only under a solemn obligation not to eat outside, but they would be spotted at once by the disturbance of the balance. The nitrogen that goes into the body either is stored in the system and becomes a portion of the tissues and is broken down and gradually comes out in the urine or it comes out in the fæces.

After the first ten days are over we begin feeding him upon foods that contain preservatives. We feed him that for another ten days and in exactly the same amounts. If there is any disturbance in his digestive functions, either he will have bad feelings or there will be a disturbance in the balance of nitrogen in the urine or in the fæces, and in one of these ways we will be able to tell what effect that substance has upon the digestive process and upon the health of the consumer.

Then after the ten days are over we put him back on the same food without that and bring him up to his normal state again. So we make a period of thirty days in which these young men are under observation. They are weighed every day on a delicate scale. Every single gram of change in weight is determined, and we expect to give an answer to these questions which will be final as to each one of these preservatives.

When these young men have had their thirty days of this sort of treatment they rest thirty days——

The CHAIRMAN. They are fit to kill at that time.

Dr. WILEY. If not before; and those that have been on the relaxation experiment come under observation. We will repeat it several times, because the problems are very important.

The CHAIRMAN. Who are they—some of your employees?

Dr. WILEY. Half of them are in my Bureau and half in the other bureaus right around me.

The CHAIRMAN. Where do you have your boarding house?

Dr. WILEY. It is in the basement of the Bureau of Chemistry. I get up every morning before 7 o'clock and get breakfast, and I stay there until 7 at night. I weigh personally every article of food myself, and sit there and eat with the boys.

Representative **Allen**. What do you call the relaxation table?

Dr. **Wiley**. That is where their food is not measured. At that table they are just eating normal rations. It is hard to be under observation for thirty days and absolutely under control in this way, and they get tired of it. We propose, if you continue your generous support, to try everything which is used in foods about which there is any question, and finally even tobacco. I am saving that to the end, to see what effect the use of tobacco will have upon digestion, and coffee and tea.

Representative **Henry**. You are working somewhat along Dr. Atwater's line?

Dr. **Wiley**. No; it is absolutely different. He is determining simply the processes of nutrition, heat forming, and carbonic acid forming in the body. We have nothing to do with that at all.

The **Chairman**. He has taken a long while, has he not, to find that out?

Dr. **Wiley**. I do not know about that, but our problem is absolutely different. He is using normal foods and only foods. We are using things that are not foods.

Representative **Williams**. You will have a hard time when you begin the tobacco business, because you will have to have a smoker.

Dr. **Wiley**. Yes; we will take a man who uses tobacco and then have him stop. I do not know how I will attack that problem, but that is one of the things we do not consider as foods. We do not propose to try kinds of foods one against the other. I have had many applications. Every man who has ever made any kind of a food wants me to try his food and give him a report. We have nothing to do with that at all. We are trying the effect of preservative substances added to foods, as your act says—coloring matters, preservatives, and things of that kind which are not foods themselves and which are used almost universally in foods.

Representative **Scott**. You have not killed anybody yet?

Dr. **Wiley**. No; we do not propose to, although we took the precaution to have each young man sign a release that he would not hold the Secretary of Agriculture responsible for anything that happened.

Representative **Scott**. Do you see anything of a result so far?

Dr. **Wiley**. We are only on the first period of our experiment; we have not commenced to give them borax. I will begin that Monday morning, or soon thereafter.

The **Chairman**. Do they know that?

Dr. **Wiley**. They do not know what they are going to take. It will be given to them in a capsule, but I am not going to tell them what it is.

Representative **Scott**. You make an estimate, I suppose, of the amount of borax that would be used in what they would eat ordinarily?

Dr. **Wiley**. We know from hundreds of analyses what they usually have, and we are going to give them more to see the effect. This borax question is one of the most important, because it is a subject now of international complication. We have this remarkable fact, that Germany now refuses to admit from this country anything that contains borax, and is sending us shiploads of borated foods, which we propose to get at if you will put in that little clause which is in italics. Of course I believe in reciprocity, but I also believe in retaliation. We ought to stand for our rights in this matter. I will not say I have no prejudices in the matter, because everybody has, but I will say to the committee that I am attacking this problem without having formed an opinion as far as my work is concerned. I am perfectly open to the conviction which will come from the results of these experiments. If I find, for instance, that borax does derange the digestion, then I am against borax. If I find it does not, that it has no effect at all, I am not against it, and we want to know the truth. That is all we are trying to get at, the truth.

The CHAIRMAN. What other substances do you propose to experiment with?

Dr. WILEY. We propose to use all common preservatives, borax, boracic acid—they act differently—sulphites and sulphurous acid, benzoic acid, and benzoates, formaldehyde, fluorides, and so on. Then there are various coloring matters used in foods, like the sulphate of copper and the sulphate of zinc. They are to be tried.

The CHAIRMAN. How long do you expect to keep those young fellows on the diet?

Dr. WILEY. It will take about five months to decide one subject.

The CHAIRMAN. It will?

Dr. WILEY. Yes; because we do not want to get results of such a nature that the work will have to be repeated. I have talked with the best physiologists in this country and laid my plans before them, and they say if we can carry them out it will be a final answer to these great questions which have only been answered by experiments on the lower animals, which may have very different results, as you know, upon the human animal.

You may make an experiment upon a cat, a dog, or a guinea pig and get a certain result. You take another animal and you get a different result. You take the human animal and you get a still different result.

We must make these experiments where they belong. You may think this is an expensive operation, and probably it is if you consider the chemical work that we do without extra expense, but it is not going to cost any enormous sum to feed these twelve men. They have pretty healthy appetites. I have already found that out in the two weeks I have been feeding them, but it is not an extravagant expenditure by any means.

Representative HENRY. You are giving them good food, I suppose?

Dr. WILEY. The best food I can get.

Representative HENRY. And all they want?

Dr. WILEY. And all they want at the relaxation table, but not at the observation table. I am giving them there just what will keep their bodily weight constant.

The CHAIRMAN. Do they complain of hunger at all?

Dr. WILEY. They go away a little hungry, but it is good for them. I will tell this committee that those boys at boarding houses never had anything like I am giving them. I am giving them good steak, and they would eat a pound of it apiece, I think, if I would give it to them.

Representative SCOTT. How much beefsteak do you give a man?

Dr. WILEY. I give the man who weighs 130 or 140 pounds about 100 grams of bread. Twenty-eight grams make an ounce. That is three ounces and a half. I know how much nourishment is in that and how much nitrogen. They then have meat and oatmeal and potatoes, and milk or coffee.

The CHAIRMAN. What is the principle in this shreaded wheat, doctor? It is whole wheat, is it not?

Dr. WILEY. I believe it is, although I have never seen it made. The natural wheat grain is composed of starch, about 65 parts; nitrogenous matter, mostly glutin, 10 or 12 parts; ash, about 1½ per cent—that is, mostly phosphate of potash and soda; carbohydrates that are not sugars, about 6 or 8 per cent; fat, about 1½ per cent, and moisture, 10 to 12 per cent. That is the normal constitution of the wheat.

The CHAIRMAN. As a ration, what does it lack?

Dr. WILEY. Nothing. It is the best balanced ration you could ever put together. It contains every element necessary to nourish a man.

The CHAIRMAN. It does not suit me. I never took it until this summer. There is a most beautiful factory for the manufacture of it at Niagara Falls, built with vitrified brick inside. It never touches the hand of an individual except as it passes along a moving table it is picked up and put in a box, after it is completely cooked and shaped and everything.

Dr. WILEY. You say it does not suit you, Mr. Chairman. It does nourish you, but it does not satisfy your appetite. You get all the nourishment out of that that any man could want, but we do not eat for nourishment always, you know. We eat for taste.

Representative SCOTT. Doctor, a moment ago I understood you to say that all the nitrogen in the food ought to pass away from the body?

Dr. WILEY. It all comes in the urea or the faeces. Of course it goes through the tissues first. What is coming out in the urea to-day is what you ate a week ago, perhaps. It has gone through your system and broken down. I do not mean that it goes right through the body; it goes through the tissues first; but all that comes out through the faeces comes out directly.

Representative DAHLE. How about nut foods. Are they well balanced?

Dr. WILEY. No; nut foods are very unbalanced. They are not a complete food at all. They are all nitrogen and oil. There is but little carbohydrate in them. A nut is composed of nitrogenous matter and oil, chiefly.

Representative SCOTT. How is the indian corn balanced?

Dr. WILEY. Cereals are all a balanced ration. Wheat is the best. I should except rice. Rice is unbalanced because it is deficient in nitrogen.

Representative COONEY. You say wheat is a perfect food?

Dr. WILEY. It is about as near a balanced ration as you could get. With rice you should always have lean meat or beans.

The CHAIRMAN. They do that in the Tropics. They have found out that fact, either from scientific research or simply by experiment. You go to the rice-eating countries and there they also eat beans.

Representative SCOTT. I did not know that.

Representative DAHLE. You spoke about feeding meats to them. Do you feed them meats every meal or only once a day?

Dr. WILEY. I feed no meat at the noonday meal at all, and very little at breakfast. I serve a pretty good 80-gram ration at dinner.

Representative SCOTT. In what shape do you feed the meat at breakfast?

Dr. WILEY. Usually in the shape of steak or hash, because I can get a better analysis of that, and it is more economical.

The CHAIRMAN. What hours do you keep over there?

Dr. WILEY. I get down there at half after 7.

The CHAIRMAN. I mean meal hours.

Dr. WILEY. The breakfast is at 8 o'clock, the lunch at 12, and the dinner at half past 5.

The CHAIRMAN. You say it will take five months?

Dr. WILEY. Yes; it takes a whole month for six men. Then we repeat it on the other six. That is two months. Suppose there is some discrepancy, I will probably make it all over again for safety. Three months is the quickest I can do it with one set. I have got work laid out for about four or five years, and I expect to live that long.

The CHAIRMAN. Do you expect to keep the table going that four or five years?

Dr. WILEY. I do.

The CHAIRMAN. You do not keep it up throughout the whole year?

Dr. WILEY. We may drop off in the hot months.

The CHAIRMAN. Will you try to keep the same set of men?

Dr. WILEY. No; I will change the sets if I can. I have a number of people on the waiting list now.

The CHAIRMAN. Are they in absolute acquiescence?

Dr. WILEY. Yes; they have taken a solemn pledge and signed it to obey every requirement.

The CHAIRMAN. But that does not bind some people.

Dr. WILEY. Of course, if I should find anyone who breaks his pledge, I would not only dismiss him from the table, but I would not want him in the Department. This is too sacred a matter to be trifled with.

The CHAIRMAN. How old are they, Doctor?

Dr. WILEY. They are all in the neighborhood of 25 or 26. None of them are under 21.

The CHAIRMAN. Have you any regulations about sleep?

Dr. WILEY. None, except this. They made a statement of their daily life first. Then they agree to follow their usual course, the same exercise, the same amount of sleep, and the same amount of work.

Representative HENRY. Are they allowed to take any alcohol?

Dr. WILEY. Not at all. They have pledged themselves not to do so during the progress of this work.

Representative HENRY. Or coffee?

Dr. WILEY. They are allowed to have water, milk, and coffee, which is all measured and weighed to them.

The CHAIRMAN. They are not allowed to drink water between times?

Dr. WILEY. Yes; but they keep a record of it. You will be interested to know that this matter has attracted the attention of scientific men throughout the whole world and also of all the people at large. I have clippings from the London Times and the various journals of Berlin, all referring to this and all commendatory.

Representative SCOTT. Speaking seriously of it?

Dr. WILEY. Yes; speaking seriously. The only light thing that has been said of it is in some of our own journals like the New York Sun. They make fun of everything.

The CHAIRMAN. Has the Sun made fun of it?

Dr. WILEY. I hope so. I would not feel right if it had not. That only shows that it is worth something, or else they would not make sport of it. All we ask of you, gentlemen, is, of course, to give us the funds. I thank you for your great patience in listening to this long harangue.

The committee, at 5.45 p. m., adjourned until Monday, December 15, 1902, at 10.30 o'clock a. m.

SUBCOMMITTEE OF COMMITTEE ON AGRICULTURE,
HOUSE OF REPRESENTATIVES,
Washington, December 15, 1902.

The subcommittee met at 10.30 o'clock a. m., Hon. J. W. Wadsworth in the chair.

BUREAU OF ENTOMOLOGY.

STATEMENT OF L. O. HOWARD, CHIEF OF THE BUREAU OF ENTOMOLOGY, DEPARTMENT OF AGRICULTURE.

The CHAIRMAN. Professor, on page 19 of the new bill I see there is nothing new in your salary roll.

Mr. HOWARD. Nothing at all, Mr. Chairman.

The CHAIRMAN. Now, in your general expenses there are a lot of italics.

Mr. HOWARD. There is an apparent increase.

The CHAIRMAN. This is in italics:

> Insects affecting field crops: (*a*) Southern section—cotton, tobacco, sugar cane; (*b*) Northern section—cereals and forage plants; investigation of the insects affecting orchard fruits: (*a*) Northern section—deciduous orchard fruits; (*b*) Southern section—citrus and other tropical fruits; investigations of the insects affecting small fruits and truck crops; forests and forest products and stored products; investigations of insects in relation to diseases of man and other animals, and as animal parasites; miscellaneous insect investigations, including the introduction of beneficial insects, quarantine work, and the study of fungus and other diseases of insects; for the expenses of insect laboratory, collections and experimental garden; investigations in apiculture and in silk culture; investigations of insecticides and insectide machinery.

That is all in italics as if it was new matter, but yet it can not be new matter, inasmuch as it is matter you have been covering, is it not?

Mr. HOWARD. We have been covering it all before.

The CHAIRMAN. It is simply the language of the clause rearranged?

Mr. HOWARD. It is the language of the clause rearranged. We are specifying more particularly what we are doing. We are making this subdivision which was asked for by the Secretary of Agriculture. He said he wished us to be more explicit in what we wanted to do. We did not draw up this clause, you understand. We submitted our estimates in our customary form, and they were made into this form by the Chief of the Division of Accounts, who always does that work for the Department.

The CHAIRMAN. Just tell the committee, in your own way, what you have been doing, say, in the Southern section. What have you been doing in cotton, tobacco, and sugar cane? Make your statement in your own way.

Mr. HOWARD. I would like to explain, Mr. Chairman, that the apparent increase of $30,000 in the lump sum is not a real increase, for this reason. There was a separate appropriation made for the silk culture investigations last year, for which you gave $10,000. That was put in a separate clause at the end of the bill. It did not come under the appropriation of my Division, but it was assigned to me by the Secretary of Agriculture.

The CHAIRMAN. It is now included?

Mr. HOWARD. It is included in this appropriation for silk culture. It is one of the last things you read in the italicized portion.

Representative HENRY. Then the real increase is $20,000?

Mr. HOWARD. Twenty thousand dollars.

Representative HENRY. Rather than $30,000?

Mr. HOWARD. Yes; and of that increase of $20,000, the Secretary has asked for $5,000 increase in the silk-culture fund. It was $10,000 last year and is now $15,000. There is another item a little further along which provides for rent of building, which would probably amount to at least $1,000, which reduces also the increase for actual insect investigation to $14,000.

You asked, Mr. Chairman, what we were doing in the Southern section on cotton, tobacco, and sugar cane.

The CHAIRMAN. Just take that clause up in your own way and tell us what you are doing.

Mr. HOWARD. At the solicitation of the Texas members of Congress particularly, last year you enlarged the appropriation for my division by $20,000, with the explicit understanding between you and myself, as the result of a telephone conversation, that that $20,000 should be devoted entirely to the cotton-boll weevil investigation, and that money is being spent during this present fiscal year on that investigation. A number of new men were employed, expert entomologists, and were sent down there and have been in the field during the whole year. They have not originated any new methods of destruction beyond those which we had already advised the Texas farmers to use; but those methods of destruction were largely slight alterations in cultural methods, in methods of cultivating the crop—the introduction of Northern seed and early planting; planting rows a little wider apart, hastening the crop along, and picking it before the weevils, by process of natural multiplication, can become very numerous, which occurs only late in the season.

In order to demonstrate that we have conducted the superintendence of the culture of the crop on two large plantations in two different parts of Texas under an arrangement with the owners of the plantations that if, through our work, there was any shortage in their crop we would compensate them and make their profit the average price of the cotton for the season. Those demonstrations, conducted on a large scale, have attracted a great deal of attention and have shown the cotton growers of Texas that it is possible to control this insect. They were getting so absolutely disappointed that the people were moving away from the infested portions of Texas, and they were seriously anticipating the destruction of the cotton crop; but the insects this year spread farther north——

Representative HENRY. You say it can absolutely be controlled in this manner?

Mr. HOWARD. It can be controlled. It is only a question of expense.

Representative HENRY. That was the result of the experiments, was it?

Mr. HOWARD. That was the result of the experiments. We knew it would be so, but we had to make a demonstration in order to prove it.

Representative HENRY. How did you come out in the matter of compensation of planters?

Mr. HOWARD. We have had to give them in one case some money on account of the fact that the contract was drawn by our business men over there in such a way that we would have to raise a certain amount of cotton per acre, half a bale per acre, which was the average during the last year; but there came a drought, so the probabilities are we will have to compensate the owners to some slight extent. If the drought had not occurred and if the contract had been drawn differently, we would not have been obliged to do anything of the kind at all.

The CHAIRMAN. You ought to protect the Government against the elements, something it is not to blame for.

Mr. HOWARD. We ought to do that. That, unfortunately, was not done in this contract, but it will be done next year, if the experiments are conducted again.

Representative COONEY. What special methods are adopted which require compensation for damage of crops in this investigation?

Mr. HOWARD. If we fail to raise on the experimental farm the average crop, we compensate the owner of the farm for the difference between the average crop and the amount that is raised.

Representative COONEY. Do you undertake the cultivation of the cotton?

Mr. HOWARD. It is done under our superintendent, but the labor and everything of that kind is furnished by the owner of the farm.

The CHAIRMAN. In other words, this was in the nature of an experiment, and the owner simply wanted to be protected against all damage that might be caused to him from the experiment if the experiment did not prove satisfactory?

Mr. HOWARD. Yes; any damage from the experiment.

Representative COONEY. What I wanted to get was some idea of what different course was pursued from that pursued by the farmers themselves.

Mr. HOWARD. We had the crop started earlier. We planted it with seed from the Indian Territory.

Representative COONEY. A different seed from what they used?

Mr. HOWARD. Yes; so as to get an early production of the bolls.

The CHAIRMAN. Did you furnish the seed?

Mr. HOWARD. No; they furnished the seed themselves. We were under no expense except for superintendence and the guarantee against loss. Then we planted the rows a little farther apart in order that the sun might get in. The idea of that is that when the weevils attack the cotton squares a great many of them fall. The weevils will develop if the cotton is high and shady and the rows are close together.

The third point is that where any child labor or any spare labor can be had in the place they are utilized in picking up the fallen squares; that is, however, a comparatively unimportant point. The important point is rushing the crop forward, getting as much off the land as you can at as early a season as possible, and then in October cutting down the cotton, sacrificing what little cotton would be gathered from that time until Chrismas time. In Texas, for example, they are picking cotton to-day, but that is the last end of the crop and it does not amount to much. They want to make every cent they can on it; but by sacrificing what little remains at, say, the middle or end of October, cutting down the cotton and plowing, the last generation of the weevil will be destroyed, and leaves nothing to make a start the next year, unless they fly in from distant points. The people say, "We can not sacrifice the top crop." What we are proving to them by this demonstration is that they can sacrifice it. If they rush the crop forward they will get the average yield.

As I say, the weevil has made an extraordinary spread this year. It has gone up 80 miles farther north.

Representative HENRY. How far has it reached now?

Mr. HOWARD. It is to-day within 60 miles of the Red River Valley. If it enters the Red River Valley we have no reason to suppose that it will not spread down into Louisiana and Mississippi. We are very much afraid of that. If it gets into those States, with their rank-growing cotton and great shade, it will be a much more serious enemy than it is in the more upland regions of Texas. Congressman Burleson is thoroughly familiar with this investigation. I talked with him yesterday, and he said he would very much like to come before your committee on the subject of the cotton-boll weevil.

Representative HENRY. He appeared last year in favor of an increased appropriation. I thought that was a separate appropriation.

The CHAIRMAN. No, sir; it was not separate, but we said that while it was part of the general appropriation for your division, it should be used for that purpose.

Mr. HOWARD. Yes, sir; and not a cent of that was ever spent except for the cotton-boll weevil.

The CHAIRMAN. Dr. Howard said he would expend the $20,000 in order to satisfy the Texas people that that thing should be looked after thoroughly. Twenty thousand dollars was the sum fixed as necessary, and he promised to expend that amount of money there.

Representative HENRY. Do you want that included this year?

Mr. HOWARD. We would like it included again.

Representative HENRY. That is included in the estimate, is it?

Mr. HOWARD. Yes; that is included here. That is a very large part of the whole appropriation.

The CHAIRMAN. It seems to be the emergency need in your Bureau at this time.

Mr. HOWARD. It is, above all other things.

The CHAIRMAN. That is what I claim, that when you gentlemen run across a think like that, other things must be dropped. That is the great need; other things can wait a little while, and the force ought to be devoted to that.

Representative HENRY. Really the appropriation that Dr. Howard asks for is $40,000 for his general work, aside from the silk and the cotton.

The CHAIRMAN. It was $45,000 last year. It is a $30,000 increase this year, of which $15,000 is an apparent increase for silk. That leaves a net increase of $15,000. I believe I am right?

Mr. HOWARD. That is right, exactly.

The CHAIRMAN. It is a net increase of $20,000, $5,000 of which is for silk and $15,000 for general purposes.

Mr. HOWARD. That is the idea exactly, the $20,000 being included last year.

This specification of the other departments of investigation in the lump sum was made more in order to make clear to the committee and people interested the character of the work we are doing and which we would like to extend somewhat. We would not ask for this if there were not an apparent and very strong demand on the part of agricultural people. Our correspondence shows that. They are after us all the time for investigations of certain things which we have not before handled and we have not the means to do. We proposed this and it is entirely within your hands. We are the servants of Congress, and what they tell us to do we will do. What they do not tell us to do we can not do, of course.

Every one of those topics mentioned there is something which needs serious investigation. Insects are damaging to the amount of hundreds of thousands of dollars a year along every one of those lines. We have investigated them as well as we could with the appropriations at hand, but we do need a reorganization of the force. We need at least eight new men in the office, and we want to start each one on some definite line of investigation and make him responsible for the work in his line. I have not been able to do that up to this time. I have had general charge of the whole thing. I have one or two good men, my first and second assistants, but, just as we have done in this cotton-boll weevil investigation, we want enough money so that we can put a trained man at the head of one thing, advising him, of course, but holding him responsible for his results.

The CHAIRMAN. That is the only way to do it.

Mr. HOWARD. Yes; that is the best way to do it, of course.

Representative HENRY. You speak of beneficial insects. I suppose you mean parasites?

Mr. HOWARD. Insects introduced.

Representative HENRY. What discoveries did you make last year?

Mr. HOWARD. We have done one or two interesting things.

The CHAIRMAN. Let us take it up in order, Mr. Henry. Do you want to touch on "the cereals and forage plants; investigations of the insects affecting orchard fruits?"

Mr. HOWARD. I do not think it is necessary to specify them.

The CHAIRMAN. Have you done anything in that line?

Mr. HOWARD. I have a special agent at present working on insects injurious to small fruits in the Northwest, and his report is about ready.

The CHAIRMAN. That seems to be a rather serious question. It is talked of a good deal.

Mr. HOWARD. Yes.

The CHAIRMAN. Spraying has been effective in most of those cases?

Mr. HOWARD. Yes. There has been a good deal of trouble up in the Northwest, and you made a special appropriation two years ago, something like $3,000, for the investigation of the codling moth in the Northwest, in Washington and Oregon, where the people reported they did not get the same results from spraying and from banding that they did in the East and in the mid-West. We sent a man out there to study the conditions and to find out why that was. He found out that it was not so at all; that if those things were carried on with the same care they were carried on in the East they would get the same results exactly; and last year he had the experimental orchard of the Hon. Edgar Wilson, formerly member of Congress from Idaho, at Boise City. The operation was carried on under his instruction there, and they had a demonstration to which fruit growers came from all parts of Idaho and Oregon. He succeeded in convincing them that they could raise fruits just as well in those States as they could in the East if they took the trouble to do it, in carrying on spraying operations, etc.

The CHAIRMAN. That closed that.

Mr. HOWARD. That closed the work on the codling moth in the Northwest. He showed that the loss of fruit in that orchard of several thousand trees amounted to only 5 per cent from the work of the codling moth, whereas in untreated orchards in the immediate neighborhood the loss was from 60 to 70 per cent of the fruit.

The CHAIRMAN. In our country the spraying of the orchards seems to have driven out that caterpillar entirely, but most of our people spray, I notice, every year as a precaution.

Mr. HOWARD. I know they do. We have not been able to do anything against the orange and lemon pests of late years—insects injurious to tropical fruits, particularly citrus fruits, oranges, and lemons. The last publication we have on that thing dates back to 1885, the last big publication. That is called the Report on Insects Affecting the Orange. One of my assistants was out in California a few years ago and conducted some experiments in southern California; but there is a constant demand from the California people, who, by the way, do not seem to have much confidence in their experiment station, and from the Florida people, about these insects affecting oranges and lemons; but we have paid very little attention to that because our whole energies were diverted toward these other investigations, which seemed to be of more immediate importance.

The CHAIRMAN. Are the citrus fruits suffering?

Mr. HOWARD. They are seriously troubled with different kinds of scale insects.

The CHAIRMAN. The San Jose?

Mr. HOWARD. Not the San Jose. It does not attack citrus fruits. It only attacks deciduous fruits. That is one good thing about the San Jose scale. They have in California the red scale, the yellow scale, what they call the long scale, and the brown scale.

Representative HENRY. Spraying does not reach them?

Mr. HOWARD. Not perfectly.

The CHAIRMAN. And washing, or anything of that sort?

Mr. HOWARD. No. The sprays that they use are entirely kerosene sprays. They call it the distillate emulsion. It is merely a kerosene emulsion, slightly modified. There is a school of fruit growers out there who claim the distillate emulsion is the proper thing, and another school who claim that hydrocyanic acid gas is the thing.

The CHAIRMAN. How much damage are these scales doing to that fruit out there? Lemons and oranges seem to be cheap enough.

Mr. HOWARD. Yes, sir; they are. But if they are left alone, not worked against, these insects would absolutely destroy the product.

The CHAIRMAN. But neither of the remedies is entirely effective?

Mr. HOWARD. No; neither of them is entirely effective. That is one reason why I am working on the introduction of these beneficial insects that Mr. Henry speaks of. There is more chance for the introduction of beneficial insects which will kill scale insects than any other class of injurious insects.

The CHAIRMAN. What have you done in this introduction that Mr. Henry asks about? Have you done anything?

Mr. HOWARD. The last thing we did has been advertised extensively in the newspapers—the introduction of a lady-bug beetle from China to kill off the San Jose scale.

The CHAIRMAN. Has that been a success?

Mr. HOWARD. It is too early to say whether it is a success or not. We have bred them by the thousands on the grounds of the Department of Agriculture under cover, and have sent them out by the hundreds to State experiment stations, where entomologists are employed, in regions where this San Jose scale is abundant. That sending out was done this summer. Of course, those fellows will have to breed them and confine them before they can get a large stock and liberate them.

The CHAIRMAN. What do you call it; the lady-bug beetle?

Mr. HOWARD. Yes; one of those little fellows with a red spot on its back.

The CHAIRMAN. It originated in northern China, did it not?

Mr. HOWARD. In northern China, yes; north of the Pekin-Tientsin road, south of the great wall. Mr. Marlatt, my principal assistant, investigated the thing in Japan. He found the scale was in Japan, but that it was not a native of Japan, but was apparently introduced from the United States on apple cuttings and things of that kind.

In the same way we have introduced this last year a little caterpillar from the south of Europe, which eats out the inside of the black scale, which is the greatest foe of the olive in California. That we succeeded in bringing over alive. We got it in Italy through one of our correspondents there. It has been acclimated, apparently, by Mr. Craw, of the State board of horticulture out there, and is being sent out. The black scale is the greatest enemy to olive culture in California at the present time.

The CHAIRMAN. Do they have the same scale in Italy?

Mr. HOWARD. It keeps the scale down in Italy. The black scale is not a feature in olive cultivation in Italy at all. I think if we can succeed in breeding this caterpillar and acclimatizing it in California there is no reason why we should not have the same relative absence of black scale that they have in Europe. We are doing a great many things of that kind. We introduced an insect from Hungary last year which feeds on the asparagus beetle. I do not know whether we can make a success or not, but you can see from what has happened in the experience in California with the white scale, and the Australian lady bug, and two or three other successful importations that it does not pay to lose any opportunities to introduce one of these things. If we make ten failures, it does not matter, provided we make one success. At least, that is the way I look at it.

Representative HENRY. Have you made any further discoveries regarding the elm-tree beetle? Have you been able to find a parasite that would destroy the elm-tree beetle?

Mr. HOWARD. There are no natural enemies of the elm beetle in Europe. It seems to be one of those insects that is protected by some disagreeable odor or taste. Even the birds will not eat it.

Representative HENRY. Where did that come from?

Mr. HOWARD. It came from Europe.

Representative HENRY. Is it destructive there?

Mr. HOWARD. It is quite destructive.

Representative HENRY. But there has been no remedy for it?

Mr. HOWARD. No remedy except spraying.

Representative HENRY. You have nothing to add to what you have already published on that subject?

Mr. HOWARD. We have nothing to add to what we have already published.

The CHAIRMAN. What spray do you use?

Mr. HOWARD. An arsenical spray.

Representative HENRY. There is a good deal of scraping of the tree. Do you regard that as severe?

Mr. HOWARD. I do not think that is good for trees; do you?

Representative HENRY. Do you think it exterminates the beetle?

Mr. HOWARD. No; it is unnecessary.

Representative HENRY. It does injure the trees.

Mr. HOWARD. I think so; don't you?

Representative HENRY. I have said so at home. Up the Connecticut Valley the elm trees are being injured by it and have been for some years. There does not seem to be any sufficient remedy for it yet except spraying. They have tried scraping, and they have tried binding cotton around the tree and all that, but the spraying seems to be the only effective thing. I was in hopes you might secure a parasite that would be effective.

Mr. HOWARD. I was over in Europe this summer on the silk-culture business arranging for the purchase of eggs and mulberry cuttings and machinery, and in Paris I found this same elm-leaf beetle absolutely stripping all the elms in the Bois de Boulogne. They say, however, it rarely does damage over there. Of course the climatic conditions are different there from what they are here.

There is a very important branch of our work, Mr. Chairman, on which we want to spend more money, and that is the investigation of insects injurious to forest trees. With the slight increase which you gave us last year we were able to bring to Washington the best-informed man on the subject in the country, Dr. A. D. Hopkins, of the agricultural experiment station of West Virginia. He is really the only forest-insect expert in the United States. We were obliged to pay him $2,250 out of our lump fund in order to get him, but his expenses have largely been paid by cooperation with the Bureau of Forestry. They have given money for the traveling expenses. He has taken several trips. He has been in the Black Hills country, where there is a bark-boring beetle which has done an immense amount of damage. He has already suggested certain methods to them up there which have encouraged the forest people very much. Mr. Pinchot, the Chief of the Bureau of Forestry, who would look at the thing from the forestry standpoint, as we look at it from the entomological standpoint, says he thinks Hopkins's services are going to be invaluable to the forest interests of the country. He considers him a clear-headed, practical man, and with his excellent knowledge of these insects he is showing that forestry men can save trees where they were not able to save them before at all.

The CHAIRMAN. From the commercial point of view?

Mr. HOWARD. From the commercial point of view entirely. I should like to be able to pay Dr. Hopkins's traveling expenses out of my own fund and not ask it of the Bureau of Forestry. I should like, also, to give him a couple of young assistants, students, or something of that kind. Therefore if this increase is allowed I calculate to devote $5,000 of that increase to the subject of insects injurious to forests.

The CHAIRMAN. Is he the gentleman who came up into our country and examined the hickories?

Mr. HOWARD. The same man.

The CHAIRMAN. They are dying by the thousands. I never saw such a sight in my life. Beautiful young hickory trees are dying by the thousands. I venture to say I marked over a hundred hickory trees right on my own home place to cut this winter or this summer, and I marked about the same number last winter and the fall before.

Mr. HOWARD. He went up to see some one by the name of Wadsworth. Is that a relative of yours?

The CHAIRMAN. That is my cousin, Austin Wadsworth. He was chief of the State fish, game, and forestry commission of New York.

Mr. HOWARD. Does your cousin say that the advice Hopkins gave him was of value?

The CHAIRMAN. He had no advice to give. He did not know what would stop it, he said. I bored a couple of trees right at my dooryard. I saw in some agricultural paper that if you bored holes in apple trees and filled them with sulphur and plugged them it might have some effect. I tried it on those two trees. At that time they were losing the ends. The ends seemed to drop off the limbs. That seemed to stop it, but I saw they were going again this year, and they will probably be dead another year.

Representative HENRY. Is the oak affected in the same manner?

The CHAIRMAN. No. This takes in young trees and all kinds of trees—beautiful trees right out in a lawn.

Representative HENRY. Can you see that the tree is attacked by borers or some sort of insect?

The CHAIRMAN. I could not see it because I was not an expert, but he came up there and showed it to me. It girdles the tree, I think.

Representative COONEY. What part does it work on?

Mr. HOWARD. It works only in the terminal shoots.

The CHAIRMAN. He says it works in the under bark, or whatever you might call it, and girdles the tree.

Representative HENRY. That kills a tree?

Mr. HOWARD. Yes.

Representative HENRY. The cutting of the tree only retards its growth?

The CHAIRMAN. Yes; but it is a sad sight. Excuse my interruption, Professor.

Mr. HOWARD. I do not know what we can legitimately do in the Department of Agriculture in regard to this matter of the transmission of diseases by insects, which has become such an important medical feature now-a-days. They have come to us because we are the only Government institution which has anything to do with entomology.

The CHAIRMAN. That is new, I think.

Mr. HOWARD. That is new in here. I have my doubts as to whether that could be considered directly agricultural. I have consulted the Secretary of Agriculture about it. He says we ought to do something of that kind. Anything that affects the health of the farmer of course affects agriculture.

The CHAIRMAN. But that is branching out pretty far.

Mr. HOWARD. I brought it up simply for your comment. I wanted to see what you thought about it. I published last year a farmers' bulletin on malaria and typhoid, two diseases which are conveyed by insects. Viewing the thing entirely from the standpoint of the farmer, there has not been any bulletin published by the Department for a long time which has attracted so much attention as that has; and there has been a tremendous demand for it. So that was put in, and we should like to pay some attention to the study of the insects which are concerned in the transmission of disease not only to man, but to domestic animals. It seems to me it is a very important subject of investigation.

The CHAIRMAN. Do you mean the investigation of insects in relation to diseases of man?

Mr. HOWARD. And domestic animals, it says, does it not?

The CHAIRMAN. Yes.

Mr. HOWARD. I am just explaining why that was put in.

The CHAIRMAN. This reads: "Miscellaneous insects investigation, including the introduction of beneficial insects, quarantine work."

Mr. HOWARD. That is a mistake. That quarantine work ought to have been left out. This was drafted originally at a time when that bill was before your committee about quarantine work, you remember, to quarantine imported plants, etc.

The CHAIRMAN. Oh, yes; the nursery stock.

Mr. HOWARD. I thought it might very well be struck out.

The CHAIRMAN. Now, "The study of fungus and other diseases of insects."

Mr. HOWARD. There is a lot of investigation which is extremely interesting and which we have done something in. In South Africa they claim they have been able to destroy the grasshoppers, or locusts, by spreading a fungus. We have brought over a dozen tubes of that fungus and have made several hundred subcultures in the Bureau of Animal Industry.

The CHAIRMAN. Culture is the technical name for what?

Mr. HOWARD. It is the fungus growing upon agar-agar or some gelatin medium.

Representative SCOTT. I suppose you are familiar with the work done in that line by Dr. Snow in Kansas?

Mr. HOWARD. The chinch bug. Yes; I am very familiar with that work. This grasshopper work has been carried on for the past two seasons. Those culture tubes have been sent out very largely in Colorado and Nebraska and portions of Texas, and the reports received from people are very confusing. About three-fourths of them say they did no good at all; the other fourth say they have absolutely succeeded in killing off the spawns of young locusts by carrying out the directions in spreading this fungus. We should like to try other fungi against insects. We should like to have some one who is an expert on fungus and bacterial diseases.

The CHAIRMAN. You would not be duplicating work of the plant industry at all, would you?

Mr. HOWARD. It would not duplicate it at all. It would be done in cooperation with them. Of course the relations between the different bureaus are very close sometimes. They are all amicable, you know.

The CHAIRMAN. I understand that.

Mr. HOWARD. Whenever those things come in we do it cooperatively.

Representative SCOTT. The experience in Kansas in the matter of the attempt to exterminate the chinch bug showed that the success of the experiment depended very much on conditions that prevailed at the time.

Mr. HOWARD. Weather conditions?

Representative SCOTT. Weather conditions; and it depended also very much on the skill and intelligence with which the fungus was handled. When the weather conditions were exactly right and the poison was properly administered it was markedly successful. Dr. Snow published a report, with which you are doubtless familiar, of one season's work, when it was estimated from the reports which the farmers themselves sent in that this work had saved the farmers of the State not less than $200,000 worth of wheat that year by protecting their fields from the chinch bug, and for a number of years the legislature made an annual appropriation of $3,500 to carry the work on; but it was finally abandoned, because, as I say, there were so many times when the conditions were not favorable that the farmers got tired of it.

The CHAIRMAN. The Hessian fly has disappeared entirely?

Mr. HOWARD. Yes, practically.

The CHAIRMAN. A year ago there was a great howl went up in regard to that. I think some of the farmers sowed a little later—sowed a strip around their fields, and let that come up and plowed it under. The Hessian fly has disappeared from our country entirely; but if you had listened to the cry that went up the year before, you would have had every expert in the Government employ right there.

Mr. HOWARD. Have they introduced that new resistant variety of wheat there?

The CHAIRMAN. They have introduced some new variety of wheat there. I did not change my seed wheat at all. I changed from one farm to another, but last year my wheat was absolutely eaten up. This year I had a first-rate crop with the same varieties of wheat.

Representative HENRY. Does it not depend on when you plant it?

The CHAIRMAN. I say that is one of the recommendations made by the Department.

Representative SCOTT. In our State it seems to have been pretty clearly demonstrated that after the swarm which hatches out in September there is no further danger.

Mr. HOWARD. That is true.

The CHAIRMAN. The Hessian fly swarm, you mean?

Representative SCOTT. Yes.

Mr. HOWARD. Yes; that is the advantage of the trap strip Mr. Wadsworth was talking about.

The CHAIRMAN. What do you call an insect laboratory, Doctor?

Mr. HOWARD. We have an insectary, as we call it there. You have been in there yourself, and so has Mr. Henry. There we study insects in confinement. We have to study the full life history of a pest before we can get at the critical point at which to attack it. We can do that some of the time outdoors and the rest of the time indoors.

The CHAIRMAN. What you call an insect laboratory?

Mr. HOWARD. It is part of the insect laboratory. Then of course we have to have a small chemical laboratory for the mixing of insecticides. That is all contained in that building, which we call the insectary, which might be called an insect laboratory.

The CHAIRMAN. Can you not eliminate that word "laboratory" in some way?

Mr. HOWARD. Yes; if you do not like it. That is the place where the men mount all the specimens for preservation, and so on.

The CHAIRMAN. Laboratory is not really the proper name for it.

Mr. HOWARD. No; it is the customary term for that sort of thing. I suppose you would not like "insectary" any better, would you?

The CHAIRMAN. Yes. I want to eliminate the word "laboratory," if it is not a laboratory, because there seems to be a duplication of laboratories in the Department. Can you do any chemical analyses in your laboratory at all?

Mr. HOWARD. No; we call on the Bureau of Chemistry to do all that work for us.

The CHAIRMAN. You simply use your chemical laboratory for mixing certain things?

Mr. HOWARD. For mixing certain things. That is all.

The CHAIRMAN. For making tests?

Mr. HOWARD. That is all. There has been quite an extensive work carried on in cooperation with the Bureau of Chemistry in connection with patent insecticides, that are advertised all the while, and also on the standard insecticides, as to their purity.

The CHAIRMAN. Would you call that an insectary?

Mr. HOWARD. Yes; if you like that better than "laboratory." Then there is a small garden right behind the laboratory. Of course experiments like the experiments with these lady bugs on the San Jose scale can be done only on a very small scale, and when we want a good field experiment we go off into the region of the crop.

The CHAIRMAN. What are you doing in investigations in apiculture?

Mr. HOWARD. We have not been doing very much because we have not had very much money. Mr. Benton, the man in charge, is one of the best bee men in the country, and he is making some experiments in regard to the artificial fertilization of queens; but I should like to give him a little more money, so that he can employ at least clerical help and pay for travel. His reports have all appeared in print. The reports are published and show exactly what he is doing. I think I have something right here that shows what he has been doing, if you care to listen to it.

Representative **Cooney**. What does apiculture refer to in your department, Doctor?

Mr. **Howard**. Bee culture; the care of bees.

Representative **Cooney**. I presume it has to do with the diseases of the bee.

Mr. **Howard**. Yes; it has to do with bee diseases. We would like to investigate a new bee disease which has done a great deal of damage in your State, Mr. Chairman, a disease which is killing off a great many colonies of bees.

In this report it is said:

> In apiculture it is proposed to specially investigate the subject of artificial pasturage, which hitherto has not received the attention it deserves. A series of experiments will be entered upon to determine what crops may be profitably employed to fill the gaps in the honey yield or to create artificial pasturage for apiaries, and an effort will be made in this connection to introduce honey plants from abroad. It is proposed to import and test various races or species of bees that are now little or not at all known in this country. For example, the race native to the Caucasus and those found in Dalmatia, Austria, and notably the large bee of the East (*Apis dorsata*), to be obtained from the Philippine Islands. The breeding of crosses will be continued, and the collection of statistics is proposed.

Silk culture is something the Secretary is very much interested in, and he wants to make a go of it if he can. The Department conducted experiments a good many years ago under continued appropriations of Congress, and it came to the conclusion, as expressed in the final reports, that silk culture could not be made to pay in this country without an import duty on raw silk. There the matter was left. Congress took the Bureau at its word. The McKinley bill was then under consideration.

The **Chairman**. That was Secretary Morton's report, was it not?

Mr. **Howard**. No; it was just before Morton came in, if I remember rightly, and the Committee on Ways and Means refused to put any duty on raw silk. Of course the idea was greatly antagonized by the manufacturers of silk in the country, and so the matter was dropped. The Secretary of Agriculture now thinks that conditions have changed to some extent. The price of raw silk is a little higher; and as we have, especially in the South, a great many absolutely unemployed people who can not make any money at all, and that by introducing the cultivation of the silk worm a small household industry can be started, which would bring a few dollars a year into some of those families, carried on simply by the nonproductive members of the family; and it was with the idea of seeing whether this could not be done that he asked for the appropriation of $10,000 last year, which you gave him.

Representative **Henry**. That was the method in Connecticut and Massachusetts seventy-five to one hundred years ago.

The **Chairman**. What was done with that $10,000?

Mr. **Howard**. I have employed an expert, a Miss Kelly, who has been studying silk culture abroad for three years. She has been studying the most advanced expert methods of cultivation of the worm, cultivation of the tree, and particularly the guarding against disease. I have employed her, and she has prepared two manuals, one on the cultivation of the mulberry, which has been revised in the Bureau of Plant Industry, and the other on the raising of the silk worm, both of which are about to be published and distributed with mulberry cuttings and with mulberry seeds.

Representative HENRY. Those two things have to go together. There is no natural mulberry growth in the South which will answer the purpose?

Mr. HOWARD. There is a great deal of the best variety of the white mulberry grown in the South.

Representative HENRY. Now?

Mr. HOWARD. Now. In many cases those trees are the descendants of the old trees you speak of, that were started in this country in the early part of the century, at the time of the "multicaulis fever."

Representative HENRY. They are not indigenous to the South?

Mr. HOWARD. No; but they spread wild through this country, all down through the eastern coast, in the Appalachian Mountains. It grows out your way, does it not, Mr. Scott?

Representative SCOTT. I do not know that that particular variety does, but I think they have found in our State that the Osage orange is very satisfactory.

Mr. HOWARD. The Osage orange is not as good as the mulberry. When the silk worms feed for several years on the Osage orange, the quality of the silk deteriorates. We have purchased this winter a large quantity of tested eggs from Europe. They call them bacological examinations over there. They examine each moth to make sure her eggs are sound. We are going to distribute those this winter and spring to people who can show us they have proper food in their neighborhood. Then we are distributing mulberry cuttings and mulberry seed, also introduced from Europe, to those people who have no mulberries in their immediate vicinity, so that they can start the culture.

The CHAIRMAN. How quick a grower is it?

Mr. HOWARD. It will grow to the bearing size in three or four years; that is, to such a size that it will stand the shock of collecting a great number of leaves from it in the spring. It has to be grown in a certain way and cut in a certain way, and while these old trees we have here will make good food, they are not as good as those that will be grown under the instructions of the Department. It will have to be a progressive experiment.

Representative SCOTT. In what latitudes does that tree grow most successfully?

Mr. HOWARD. It grows most successfully in the provinces of Lombardy and Piedmont, in northern Italy, which correspond very closely to the country down here through North and South Carolina and north Georgia. The Piedmont country down here undoubtedly got its name from the similarity in climate to the Piedmont region in Italy.

Representative HENRY. I have on my farm now relics of the old mulberry culture which used to be carried on there—trees that are 8 or 9 inches in diameter.

The CHAIRMAN. That whole $10,000 is expended in that way, is it?

Mr. HOWARD. It is not all gone yet.

The CHAIRMAN. No; it has to last until the 1st of next July. What is the salary of Miss Kelly?

Mr. HOWARD. We give her $150 a month, and we do not know how long we shall need her. We call her expert adviser in such matters, and it is necessary to have such a person.

The CHAIRMAN. What do you want the other $5,000 increase for?

Mr. HOWARD. This is the point: The question as to what we shall do with these silkworm cocoons is a very serious question. There is no market for silkworm cocoons in this country. There is no market for silk made in this country. All of our silk is imported. It is called raw silk, and that is probably one reason there was no duty put on it. It is all imported from Italy, France, Japan, and China. If we want to compensate these people or enable them to be compensated for their labor in raising the cocoons we have got to establish in this country a market for the cocoons or send our cocoons abroad.

Representative HENRY. Can not the silk be reeled right on the farm, as it used to be?

Mr. HOWARD. It can, but nobody will buy that silk. It would be of inferior quality.

Representative GRAFF. Is there not an agreement among the silk manufacturers of the country not to buy these cocoons?

Mr. HOWARD. I do not know whether there is or not.

Representative GRAFF. Or any other American product out of which it could be made?

Mr. HOWARD. They are certainly doing everything and will do everything they can to antagonize this industry.

Representative GRAFF. Why should they do so?

Mr. HOWARD. Because they fear that the minute the industry gets thoroughly established Congress will put an import duty on raw silk and reduce their profits. They get their raw silk without duty now.

Representative GRAFF. I was told by a gentleman in Peoria, who is engaged in perhaps a small way in this industry——

Mr. HOWARD. Mr. Hill?

Representative GRAFF. Mr. Hill spoke to me about it, and then there is another gentleman who spoke to me about it, a German. I have forgotten what his name is. He said that the silk manufacturers of the country were banded together in an agreement not to purchase any American product out of which the finished silk could be made.

Mr. HOWARD. I have not heard about that at all.

Representative COONEY. Doctor, to what extent is the territory of the United States adapted to this silk culture and product?

Mr. HOWARD. Silk worms can be grown wherever the mulberry will grow.

Representative COONEY. Without reference to climate or other conditions?

Mr. HOWARD. The mulberry will grow successfully in a great proportion of the territory of the United States. It will grow almost everywhere.

Representative GRAFF. This man stated to me that there was no market for this silk after it had been gotten from the worm.

Representative HENRY. Allow me to say right there, Mr. Graff, that the silk manufacture of this country was based upon silk grown in this country. It was not imported originally. It was all grown here, and the silk industry was based upon silk that was actually grown in this country and reeled in farmers' houses.

Representative COONEY. What broke it down, Mr. Henry?

Representative HENRY. The high price of labor, the introduction of cotton manufactures, which gave employment to the women and children of New England.

Mr. HOWARD. The manufacturers of silk seem to have a very good point when they state that silk can not be reeled in this country which will be commercially valuable; that is, the old family reeling produces a very inferior quality of reeled silk. The reeling of silk has got to be a tremendously expert thing nowadays. I am trying to get around that. I have contracted out of this fund for two silk reels from Lyons, France. I am going to bring them over here and try to see what we can do with these silk cocoons which will be raised from eggs which we distribute.

The CHAIRMAN. Have you any doubt that cocoons can be raised?

Mr. HOWARD. There is no question about it at all. It seems desirable to bring over a trained reeler from the other side, and to train some American girls in reeling upon these reels.

Representative SCOTT. Can you bring that man over under the law?

Mr. HOWARD. Yes; I can bring him under the law. It is a new industry.

Representative SCOTT. Do you think we have reached the point where we can do this thing advantageously? Do you think labor is cheap enough in this country to do it? It seems to be a question of labor.

Mr. HOWARD. I do not know, I am sure. I have not made up my mind on that yet.

The CHAIRMAN. That is commercial.

Mr. HOWARD. These expert reelers over in Lombardy get 20 cents a day, and they are very expert.

Representative GRAFF. Twenty cents a day?

Mr. HOWARD. Yes.

Representative GRAFF. Some one who appeared before this committee at the last session, at the time we were discussing the appropriation of $10,000, I think, for the encouragement of this industry, said that he thought it might be used advantageously in the South, amongst the negro children. I think that was Secretary Wilson.

Mr. HOWARD. That was Secretary Wilson's idea; yes, sir.

Representative SCOTT. If the skilled labor connected with the silk business demands only 20 cents a day in Europe, what does the common labor connected with it cost?

Mr. HOWARD. Well, I can tell you what the common labor amounts to. There is one estate which I visited which has 6,000 acres of ground and has 2,000 peasants on it. That includes the children, the grown people and all. Those peasants have formed a cooperative society, an agricultural society, the first thing of its kind that has ever been started in Italy. They have paid the rental of their land, this 6,000 acres, from raising silk cocoons alone. Each family has about 3 acres of land, or something like that. They have paid the rental of the land to the proprietor of the estate from cocoon raising alone. The rest of the stuff which they brought up on the land has gone into the family pot. They raise vegetables and corn and things of that kind.

Representative GRAFF. These people who had silkworms in the city of Peoria told me they were making a good living out of it. One of them, the one to whom I alluded as being a German, told me he had made something like $100 a month out of it.

Representative SCOTT. What did he do with his product?

The CHAIRMAN. Who did it sell to?

Representative GRAFF. He said that was the difficulty, finding a market for these cocoons, but he had succeeded in finding a market somewhere for those that he had, and the only thing he feared was that his market would shut off. It seems he had only one place where he could dispose of them at all.

Mr. HOWARD. He sells to schools. The schools want to illustrate these things.

Representative GRAFF. I presume that is it.

The CHAIRMAN. Do you know the man?

Mr. HOWARD. I know who he is; yes.

The CHAIRMAN. Have you seen his place at all?

Mr. HOWARD. No; I have not been out there. There are a number of people in different parts of the country who are engaged in that way, who sell the things as curiosities to people who are interested, such as the schools, where they are used as exhibits. There are two or three large manufactories of silk in this country where they have a silk reel, and they carry on the industry as an advertising feature.

Representative GRAFF. After all, we would hardly be warranted in encouraging this industry unless there is some fair expectation that it is going to be a real industry, that it is going to be justifiable from an economic standpoint, and in that the main problem is the question of wages. If it does not afford pay of more than 20 cents a day I have my doubts about it.

Representative SCOTT. Mr. Chairman, what are the conditions that prevail now which lend a hope that the industry will succeed any better than it succeeded forty years ago?

The CHAIRMAN. That is what I want to know. The Secretary gave assurances last year that he had some idea that conditions had changed so that the industry might be resumed here, and that is what I want to find out. That is the question I put to the doctor, whether we had reached that point where we could go into it again.

Mr. HOWARD. The price of raw silk is a little higher. That is about the only thing I have been able to find out. I was connected with the work fifteen years ago when the Department was carrying it on. I had charge of it at one time.

The CHAIRMAN. What was your opinion then?

Mr. HOWARD. I agreed perfectly with the final conclusion which was signed by Professor Riley, my chief at that time, and by Phillip Walker, silk-culture expert, that it could not be made to pay in this country.

The CHAIRMAN. Labor is not any cheaper now than it was then, or less employed?

Mr. HOWARD. No.

Representative HENRY. The Secretary's idea as he explained it last year was, that all through certain sections of the country distant from manufacturing communities this industry can be carried on, on the farm, in a small way, just as it used to be years ago. It is not really an experiment. An industry that has existed for three-quarters of a century, as this did, is not an experiment. Within 20 miles of my home there were a dozen small silk mills when I was a boy.

The CHAIRMAN. Something has driven them out of business. What has driven them out of business?

Representative HENRY. The high price of labor.

The CHAIRMAN. What is there to-day that would induce people to go into this business again?

Representative HENRY. The Secretary thinks that in remote sections labor will be cheaper.

The CHAIRMAN. What signs are there of that? That is the great difficulty. American labor is not ready for it yet. In Germany the women and children go right into the beet fields and thin out and hoe and plant and all that sort of thing, and they succeed at it; but I suppose the cost of an acre of beet sugar in America in the item of labor alone is probably three times as great as the labor for an acre of beets in Germany. That is all there is of it, looking at it simply from the commercial standpoint.

Representative CONNELL. That is true in relation to silk culture, too.

The CHAIRMAN. It looks so to me. The question is, how fast we ought to go into this business. Here is an estimated increase of $5,000. That is quite a big percentage. We had $10,000 last year, and we now attempt to jump it immediately to $15,000.

Representative COONEY. That industry, if carried on against the will of the merchants and those who deal in that product, will require a great deal more money to inaugurate it in this country than it otherwise would if there was a sentiment among the merchants who deal in silk in favor of a home product.

The CHAIRMAN. You know we only made the appropriation last year. You might say it was only available the first day of last July—six months ago. It is preliminary work, practically, is it not?

Mr. HOWARD. Yes; the insect can only be raised in the spring time. The springtime season had already passed last year. In order to get people started at this thing at all—I do not exactly like to use the expression "bounty"—but this appropriation would really have to be used in that way. We will have to buy their cocoons from them.

The CHAIRMAN. What will you do with them?

Mr. HOWARD. We will either reel them ourselves or else we will sell them abroad.

The CHAIRMAN. That is engaging in a commercial enterprise on the part of the Government, practically.

Mr. HOWARD. It looks like it; yes. You know fifteen years ago we had an electric reel running at the Department. We had it operated on commercial principles; that is to say, we kept a strict account of the expense of running the reel. We had an Italian operator over here. Then we paid for cocoons which they raised from eggs. We paid them exactly what we could afford to pay after selling the reel product to the manufacturers and deducting the expenses of the operation. The amount which we paid those people was so small, the amount we could afford in a commercial way to pay them was so small, that in less than three years every person interested in it dropped out and said they would not do it any more. The amount of pay was not sufficient.

Secretary Wilson is perfectly familiar with that investigation, but he says we did not strike the right people; that people went into it with too great hopes; that they expected to make too much money out of it; but he insists there is, particularly through the South among the poor whites and negroes, a class of people who would be satisfied with the compensation that we were able to give, because the labor involved is that of the nonproductive members of the family and it is not labor which continues during the whole year, but only four or five weeks in the late spring.

Representative GRAFF. It is comparatively simple?

Mr. HOWARD. The work is comparatively simple. That is Secretary Wilson's idea. He says if we can give those people what we gave the other people they will be satisfied with it, and gradually the industry will be started in that way.

Representative GRAFF. Did you explain, before I came in, what became of this $10,000?

The CHAIRMAN. It was only available the 1st day of last July. It has only been available six months. Is it all expended?

Mr. HOWARD. A large proportion of it is yet unspent. It will be continued the 1st of next July. As I explained to the other members, I have employed a silk-culture expert at $150 a month, who has been preparing printed matter for distribution, with mulberry cuttings and seeds. I have contracted for the introduction of silk-worm eggs from abroad, examined microscopically to be sure they are free from disease and have also contracted for mulberry cuttings and mulberry seeds from abroad. I have been over to the other side myself, my expenses being paid out of this appropriation, and I have also ordered two reeling machines to do our reeling on. That much work will probably use up in the neighborhood of $5,000 of the appropriation.

Representative GRAFF. I think this German to whom I talked stated he had found, aside from the mulberry, a native tree they could feed on advantageously, and my remembrance is it was the Osage orange.

The CHAIRMAN. Mr. Scott reported that also from Kansas, but the doctor's answer to that was——

Mr. HOWARD. It will do as an emergency food.

The CHAIRMAN. But not as a steady diet?

Mr. HOWARD. Not as a steady diet. We used the Osage orange for fifteen years. We had a race of worms which we called the Osage orange worms, because they never fed upon anything else for fifteen years. At the end of that time we noticed a degeneration in the quality of the silk. We submitted it to fiber experts, and we found it would not do as a steady diet.

I do not know that I have anything further to say on that silk-culture matter, Mr. Chairman.

The CHAIRMAN. There is nothing new there?

Mr. HOWARD. The words "rent of building," not italicized, are new.

The CHAIRMAN. Where is that?

Mr. HOWARD. Just before the last italics.

The CHAIRMAN. How much are you going to use for that, Doctor?

Mr. HOWARD. I think if we rented one of those little houses across B street, at an expense not to exceed $1,000, for next year that would accommodate us very nicely.

The CHAIRMAN. Without furniture? A vacant house for $1,000?

Mr. HOWARD. One was offered to us at $800, but we could not take it.

The CHAIRMAN. I say, is not that a pretty good price? Is not about $40 or $50 a month a good price for those small houses?

Mr. HOWARD. It ought to be; yes. Forty dollars a month ought to be enough.

The CHAIRMAN. I see a number of houses advertised here for $50 or $60 a month.

Mr. HOWARD. I think that estimate of $1,000 included the necessary furniture, too. They offered one of those houses for $750, and we did not bargain with the man because we knew we could not rent it.

The CHAIRMAN. You do not want that simply for the silk culture, but for the general purposes of the office?

Mr. HOWARD. For the general purposes of the office. Some of my men now occupy desks in the statistical division. Five of my men have desks in the National Museum because there is no room in our building.

The CHAIRMAN. Over in the National Museum?

Mr. HOWARD. Over in the National Museum, because the Department can not get room for them. Three of the cotton-boll weevil men are coming in from the field and I do not know where to put them.

STATEMENT OF HON. ALBERT S. BURLESON, REPRESENTATIVE FROM TEXAS.

Mr. BURLESON. Mr. Chairman, I do not know what statements Mr. Howard has made in reference to the Mexican boll-weevil experiments, but I do earnestly hope you will allow him the money he wants to continue these experiments.

I want to say that at the lowest estimate this insect pest destroyed over $10,000,000 worth of property in Texas last year.

Representative HENRY. Last year?

Mr. BURLESON. That means this present crop year.

The CHAIRMAN. The year just closing?

Mr. BURLESON. It has progressed nearly over the entire cotton region of Texas; that is, where cotton is cultivated; in fact, has reached a point in north Texas within 60 miles of the Red River. Whenever it reaches the Red River, in my opinion, and in the opinion of men who have made careful investigation of the habits of this pest, it will strike down the river and be quickly carried into Louisiana and Mississippi. Whenever it reaches Mississippi and Louisiana, owing to the climatic conditions there, the people in those States will be compelled to abandon the culture of cotton.

This appropriation we ask of $20,000 is a mere pittance compared with the damage last year. We should in fact be allowed a few thousand dollars more for field experiments.

The CHAIRMAN. We decided last year that Dr. Howard could use $20,000 of his appropriation in this investigation, and he has just stated that work was done.

Mr. BURLESON. I understand that. I want to say, in connection with the experiments that are being made, that Mr. Hunter, and in fact all the men who have been placed in Texas by Dr. Howard, as far as I am advised, have given eminent satisfaction. In fact, it is believed they have been the most satisfactorily conducted experiments that have been made under the direction of the Agricultural Department in Texas.

There is another matter in connection with this boll-weevil pest that I want to bring to the attention of the committee. I recently introduced a bill asking for an appropriation of a few thousand dollars for the purpose of establishing an agrostological station in south or central Texas, and also to defray the expenses of some experiments for the purpose of ascertaining what crop can be planted in lieu of cotton. A great many of the people of the territory infested by this boll weevil, especially on the low river bottom lands, are going to abandon any attempt to cultivate cotton. In fact, in one county alone in my district, Mr. Giddings, a capitalist largely interested in farming and stock raising, told me he was satisfied that scores of heads of families had left Washington County in consequence of this condition. Land which has heretofore been cultivated in cotton is being turned out. They want to know how to turn it back into pasture land. They do not know the best grasses adapted for the purpose.

Furthermore, Texas for years has been cultivating one crop as a money crop. That is cotton. Now this boll-weevil pest is destroying practically the means of the small farmer to make a living out of the culture of cotton, and he must resort to the culture of some other crop. I would like to have some experiments made there with a view of ascertaining what paying crops can be grown in lieu of cotton.

The CHAIRMAN. Where is your experimental station?

Mr. BURLESON. As I understand it, they are not operating along that line. After I had drawn this bill I talked with the Secretary of Agriculture about it and also with Dr. Galloway, and learned that in the Secretary's report I would find that he had made a similar recommendation, or a recommendation along that line.

The CHAIRMAN. That an experimental station be established there?

Mr. BURLESON. Not a station, but that experiments of this character be made. It will take less than $10,000 for both of these purposes.

The CHAIRMAN. We are making an appropriation for the Bureau of Plant Industry which covers all that sort of thing. The Division of Agrostology is under the Bureau of Plant Industry.

Mr. HOWARD. I do not know where it should be placed, whether it should be placed under the Agrostological Bureau or the Bureau of Plant Industry, or where it should be placed; but I do think that a few thousand dollars could be expended to the great advantage of those people down there, if proper experiments were made. They are loath to give up the cultivation of cotton, and they do not know what other crop they can cultivate to take its place.

Representative SCOTT. What success have these experiments met with in the destruction of the cotton boll weevil?

Mr. BURLESON. Well, sir, I believe with all the success it was possible to hope for. To be perfectly candid with you, I do not believe we are ever going to be able to completely destroy this pest.

Mr. HOWARD. To exterminate it, you mean.

Mr. BURLESON. I believe it is a condition that confronts the man who cultivates cotton that is going to abide with him for all time to come; but by proper cultural methods, and that is the line along which Dr. Howard's bureau has been operating in Texas, cotton can be successfully grown in some characters of soil and in some sections of the State where climatic conditions are more favorable than in others. For instance, I do not believe we will ever be able to resume the successful and profitable culture of cotton along the Brazos Valley, where the cotton grows so rank and where there is so much moisture in the atmosphere. I believe in that section the boll weevil will probably propagate so fast that it will destroy the crop; but in the uplands, in the sandy land, I believe that by proper cultural methods, we may be able to make a part of a crop each year. This is all I hope for.

As a matter of fact, three years ago when I came before this committee and asked for an appropriation of $3,500 for making an onslaught on the boll weevil, I was confronted with the Hessian fly illustration that was used by your distinguished chairman a minute ago. He suggested that it was a temporary thing and would pass by.

The CHAIRMAN. No; I asked the question. I did not assert anything. I expressed the hope that it might pass away, just as the Hessian fly did.

Mr. BURLESON. I sincerely hope it will, too; but without pretending a knowledge of entomology, but with a very practical knowledge of this Mexican boll weevil, I now predict that it will never pass away; that it is in the Texas cotton region to stay. It may be that by the appropriation of a few thousand dollars you can check its progress. If you can not, the time is rapidly approaching when, because of unfavorable climatic conditions, they are going to abandon the culture of cotton altogether in Louisiana and Mississippi.

Now, to revert to this small appropriation with reference to the agrostological station——

Representative SCOTT. And while you are talking about that, please explain how it happens that your experimental station is not doing this work, and what it is doing.

Mr. BURLESON. I do not know what it is doing. To be perfectly candid with you, my experience with certain bureaus and divisions of the Agricultural Department has not been the most satisfactory in the world.

Representative SCOTT. I mean your State agricultural college.

The CHAIRMAN. The Speaker has just sent for me. Mr. Burleson, I think your case is covered exactly under the grass forage plant investigation, which says: "To collect and purchase seeds, roots, and specimens of valuable economic grasses and forage plants for investigation, experimental cultivation, and distribution." Then it goes on and says: "And the agricultural experiment stations are hereby authorized and directed to cooperate with the Secretary of Agriculture in establishing and maintaining experimental grass stations for determining the best methods of caring for and improving meadows and grazing lands, the use of different grasses and forage plants and their adaptability to various soils and climates, the best native and foreign species for reclaiming overstocked ranges and pastures, for renovating worn-out lands, for binding drifting sands," and so on. I think that would cover your case exactly.

Mr. BURLESON. It may be covered by the text of the appropriation bill, but we do not get the practical results from it. As a matter of fact—but I will not detail the experience I have had. I will say, however, I obtained one increase of appropriation for the purpose of establishing in this very section of Texas, two years ago, an agrostological station to accomplish the very ends that I now desire, and I had every assurance it would be done. In fact. the money was allowed, but the work was not done.

I am exceedingly anxious that this work shall be done. It will cost only a few thousand dollars. Ex-Congressman Giddings has appealed to me, more than two years ago, to attempt to have a work of this character done, and a station established in the region affected by this boll weevil, and I believe great good would result from it.

I submit it to you for such consideration as you gentlemen in your wisdom may see fit to give it.

Representative GRAFF. Does the head of the Bureau of Plant Industry, Dr. Galloway, or the Division of Agrostology——

Mr. BURLESON. They approve it most thoroughly.

Representative GRAFF. Do they show any hesitation about investigating this?

Mr. BURLESON. No, sir; and they approve the suggestion I make here most thoroughly.

The subcommittee (at 12.10 p. m.) took a recess until 2 o'clock p. m.

AFTER RECESS.

The subcommittee reassembled at the expiration of the recess, Hon. J. W. Wadsworth in the chair.

STATEMENT OF C. HART MERRIAM, CHIEF OF THE BIOLOGICAL SURVEY, DEPARTMENT OF AGRICULTURE.

The CHAIRMAN. Now, Doctor, we will go on with you.

Mr. MERRIAM. The Biological Survey is conducting three entirely different lines of work: (1) Investigations of the food habits of birds and animals with respect to horticulture and agriculture; (2) the Biological Survey proper, which, by studying the geographic distribution of our native plants and animals, is able to map the life zones and crop belts of the country, and (3) the work which was put upon us by the Lacey Act two years ago respecting interstate traffic in game and the introduction of animals and birds from foreign countries.

The CHAIRMAN. We gave you $10,000 last year, did we not?

Mr. MERRIAM. Yes, sir.

The CHAIRMAN. To meet that emergency?

Mr. MERRIAM. In part to meet that, and in part to enable us to continue our regular work. You remember we had not had an increase in eight or nine years in our appropriation; and some of our men were paid $900, $1,000, and $1,200 when men of the same rank in other divisions were paid $1,800, and $2,000 and some $2,400 and $2,500.

Representative SCOTT. Will you complete your statement about the work put upon you?

Mr. MERRIAM. Under the Lacey Act, which relates to all matters of game protection and preservation and the introduction of animals and birds from foreign countries, we are obliged to issue permits and inspect importations of birds and animals from all over the world into this country and we have never had a bit of money to do it with.

Representative SCOTT. You inspect them with a view to ascertaining whether they are diseased?

Mr. MERRIAM. No; with a view to keeping out species that we do not want introduced; that we know would be injurious to our agricultural industries; animals like the mongoose and birds like the English sparrow.

The CHAIRMAN. Is not that done through the regular inspectors?

Mr. MERRIAM. No; the regular inspectors do not know a mongoose from a rat, and we have to have special expert inspectors. We can not pay them, but we name men whom we know to be capable naturalists, and they are designated as inspectors by the Secretary of Agriculture.

The CHAIRMAN. They are paid by the Bureau of Animal Industry?

Mr. MERRIAM. Not at all. They are paid $5 for each inspection by the importers. The importers protest. They claim it is unfair discrimination against them; that in the case of the Bureau of Animal Industry the inspectors are paid by the Government, while in this case they have to pay for a policeman to watch their own doings, so to speak. They do not like it. We admit it is not fair. For a few hundred dollars each we could pay the inspectors. A couple of thousand dollars would pay all the inspectors at the ports of entry, both on the Pacific coast and the Atlantic coast, next year.

Representative HAUGEN. Do you propose to pay them a salary?

Mr. MERRIAM. A small salary. There are three inspectors in New York, but in all other places there are two. The reason more than one is required is that one is liable to be out of town or sick or on jury duty or something so that he can not go when a shipload of stuff comes in; and a man must go immediately, especially in cold weather.

Representative HAUGEN. Would you appoint two or three of them at a salary just for the inspection; in New York, for instance?

Mr. MERRIAM. We have three there. They are not paid anything by us, but we have found it necessary to have three so that one can always go. Which one goes is arranged among themselves.

Representative HAUGEN. How much do the proceeds amount to in New York?

Mr. MERRIAM. I think between $100 and $200 apiece. I don't know exactly.

The CHAIRMAN. Is it not a fact that all animals coming into this country are subject to the inspection of the Secretary of Agriculture, under such rules as he may deem wise?

Mr. MERRIAM. Yes; all animals—every bird and every mammal. We have made certain exceptions, however.

The CHAIRMAN. If you want a salaried man in that position it is very proper that the Secretary should appoint him under your recommendation as being an expert in that line, but I doubt whether on the lump-sum roll of the Bureau of Animal Industry they do not have charge of the inspection of all animals coming into this country to guard against infectious diseases.

Mr. MERRIAM. When a deer is imported we turn that deer over to the Bureau of Animal Industry. We have nothing to do with any animal that is hoofed. We have nothing to do with any animal that comes under the jurisdiction of the Bureau of Animal Industry.

The CHAIRMAN. It would be a very simple matter for that same inspector to stop the importation of a mongoose.

Mr. MERRIAM. But he does not know a mongoose when he sees it. There are many other animals besides the mongoose that we want to keep out, and many birds. Undesirable birds are sometimes introduced under other names. During the present year a mongoose was introduced at San Francisco under another name. It got in and got as far as the hotel. Then our inspector waited on the man at the hotel and confiscated it.

The CHAIRMAN. You could have an expert man, but it strikes me he should be paid under the Bureau of Animal Industry.

Mr. MERRIAM. The Bureau of Animal Industry has never had anything to do with matters of this kind. What we are afraid of is the introduction of species which are not stock or hoofed animals and which are not subject to contagious disease. The Bureau has jurisdiction over diseased animals; we keep out birds and animals that are not diseased, but which are likely to become serious pests, like the English sparrow and the rat and mouse and mongoose.

The CHAIRMAN. My point is that the inspector of the Bureau of Animal Industry could very easily supervise the other thing also without having an extra employee there. It seems unnecessary to have a number of extra employees simply to guard against the importation of a number of animals that are objectionable, inasmuch as all these animals, objectionable or unobjectionable, have to come under the eye of the Bureau of Animal Industry inspectors.

Mr. MERRIAM. No; only the large animals. They do not examine consignments of birds at all. Hundreds of thousands of birds are entered in New York, and there is no agent of the Bureau of Animal Industry that looks at them at all.

The CHAIRMAN. Are they not likely to bring infectious diseases in?

Mr. MERRIAM. No; they are usually song birds, but thousands often come in a single shipload. They are generally in small cages blocked together and covered with sheeting; in the midst of one of these big bunches there may be a few small cages of some birds that we would not have introduced here on any account, hence our men have to examine them. It is not proposed to pay these men much, but just enough to offset what they get now, which has to be paid by the importer.

Representative SCOTT. Why not pay them in the same way, $5 for each inspection?

Mr. MERRIAM. It could be done exactly that way, or it could be done in a small lump sum.

Representative SCOTT. The objection to paying them a stated salary is that they would come in here next year and want the salary increased, and the next year they would want it increased still further.

Representative GRAFF. They give most of their time to their regular occupations, I suppose?

Mr. MERRIAM. Yes.

The CHAIRMAN. How can that be effective if they do not give their regular time to it? How do they know that a ship is coming in if it is not their regular duty?

Mr. MERRIAM. They are notified by the collector of customs or the importer. We work in cooperation with the Treasury Department. The importers themselves are on the lookout and let our men know before the steamer arrives. They are anxious to have the inspector on the wharf when the steamer comes, because they want to take the cages away at once. Most of them have given up entirely attempting to intentionally bring in species that we do not allow in. They do it now and then without knowing it, but they do not do it intentionally; and they want our inspectors there. They have had difficulty at New York. Last year there were 200 importations requiring inspection in New York City. On one occasion when there were only two inspectors, one was out of town and another on jury duty, so that neither could be got promptly. That is why we have to have a third man there.

Representative GRAFF. What do you do with objectionable birds?

Mr. MERRIAM. They are either sent back or killed at the port, at the option of the importer; but they are not allowed to be landed. We have had many cases of that kind.

The CHAIRMAN. What are the kinds of birds or animals that are objectionable that it has been attempted to bring into the country?

Mr. MERRIAM. I can not give you anything like a full list of them. That matter is in charge of Dr. Palmer, one of my assistants.

The CHAIRMAN. Just name a few.

Mr. MERRIAM. The Kohlmeise is one; it is a German bird, of the titmouse family. Efforts have been made to introduce it in a number of places, and we have had more trouble with it than with any other small bird.

The CHAIRMAN. What are its objectionable features?

Mr. MERRIAM. It is a small bird that has proved injurious to fruit in the Old World. Curiously enough, some local societies in the West, particularly in Utah and Idaho, wanted to introduce it as an insect destroyer, imagining that it would destroy insects that are injurious to fruits there, when, as a matter of fact, the bird destroys a great deal more fruit than insects. The starling is another bird which has already been introduced a number of times and has become naturalized in New York and on Long Island. There is danger of its spreading over the country. It is an active, vigorous bird, a little larger than most of our blackbirds.

The CHAIRMAN. What are its objectionable habits?

Mr. MERRIAM. It is a grain eating bird, very destructive to grain in various parts of the old country. Then there is the European skylark, which has been introduced again and again, both in the East and in the West. Fortunately the skylark is a migratory bird in the north of its range. In the south of its range it is not; and whether or not it is a migrant after it reaches here depends on what part of the Old World it was brought here from. If it was brought from the north, it is almost sure to migrate in the fall and to get lost and not come back; but if it is introduced from a southern part of Europe and put into a part of this country where the climate is moderately mild, it will not migrate. There is a colony of skylarks on Long Island that has been there a great many years and was nearly exterminated by a severe storm some years ago; but a few escaped and they are now on the increase again.

The CHAIRMAN. What is the objection to the mongoose?

Mr. MERRIAM. The objection to the mongoose is that it destroys all ground-nesting birds and brush-nesting birds. It kills the grouse and quail and all the sparrows and birds of every description that nest on the ground or in low bushes. The mongoose is about 20 inches long and is a very active, energetic, restless animal, something like our weasel. It is very fond of birds and also preys on snakes, and will kill rats and mice if it can not get other food. It was introduced some years ago in the Hawaiian Islands and Jamaica as a destroyer of rats and mice on the plantations, but it destroyed the ground-breeding birds to such an extent that the islands were nearly devastated by insects, and then the people made a great effort to kill it off, but they were too late. It is recognized by everybody in Jamaica and in the Hawaiian Islands as a scourge. In the Hawaiian Islands it has exterminated a number of species of birds.

The CHAIRMAN. He has not exterminated himself yet in the Hawaiian Islands?

Mr. MERRIAM. No; he takes good care of himself.

Other animals we are afraid of, particularly in southern California, are the fruit-eating bats. They have been introduced again and again, but we have been able to detect them and have them killed, so that they have not been set at liberty there. It would be a very serious thing for the citrus fruit industry and for the fruit industry generally in southern California if the fruit-eating bats were allowed to become acclimated there.

Representative DAHLE. What particular work do these men have besides the inspection of these birds and animals?

Mr. MERRIAM. That is all they do for us. They are men who are engaged in business. We do not employ them at all. They simply agree to come on call and examine importations of birds and mammals in order to keep out the obnoxious species.

The CHAIRMAN. Who establishes the list of obnoxious species?

Mr. MERRIAM. We do; and we make exceptions. We allow them to introduce canaries and parrots without inspection. If the Treasury officials state that an invoice consists of canaries and parrots, we let them go at that; but sometimes a ship brings a large invoice of canaries in little square cages—sometimes thousands of them fastened together in great blocks. In some of these shipments it has happened that other birds have been brought in that were not canaries.

The CHAIRMAN. Where are most of them raised, Doctor?

Mr. MERRIAM. In the Hartz Mountains, in Germany—most of them.

The CHAIRMAN. Do you know what we pay for canaries generally?

Mr. MERRIAM. No; I do not. The Chinamen in San Francisco raise a great many individually in their quarters.

The CHAIRMAN. Why can we not raise them?

Mr. MERRIAM. We can. A great many are raised here, but they do not begin to supply the demand. There are acclimatization societies in different parts of the country who give us a great deal of trouble. They are made up of foreigners almost exclusively. They think there are no song birds in America, and desire to bring in birds from the fatherland. They put up the money and make large importations. We have had trouble with such a society in Oregon for a number of years. They have imported a great many undesirable things. Fortunately most of the birds they have imported have migrated in the fall and never came back in the spring, so that very few of them have become established there; and now, since the passage of the Lacey Act, we have a hold on them and can prevent the introduction of undesirable species. A good many of the birds they have ordered the shippers will not undertake to deliver. In that way the Lacey Act has a good moral effect. A few months ago a very large number—several hundreds—of kohlmeisen were ordered by a Salt Lake organization. The order was placed with several different dealers, but the steamboat companies declined to accept the birds.

The CHAIRMAN. On account of the regulations?

Mr. MERRIAM. Yes; and the birds were not brought here at all. The shipping companies cooperate with us very fully.

The CHAIRMAN. Then you have not a very difficult problem in excluding these undesirable birds?

Mr. MERRIAM. No; it is merely the labor of inspecting a large number of birds every year, particularly at New York. A few are imported at Baltimore and Philadelphia, and fewer still at New Orleans and San Francisco. These are the principal ports of entry.

Representative SCOTT. Have you indicated in this bill any particular sum that you want to use for this purpose?

Mr. MERRIAM. Not at all. Two thousand dollars would be adequate on any basis that it is arranged.

Representative SCOTT. I do not see anything set down here under which you could do this work if we should give you the money.

The CHAIRMAN. There is this:

> To enable the Secretary of Agriculture to carry into effect the provisions of an act approved May twenty-fifth, nineteen hundred, entitled "An act to enlarge the powers of the Department of Agriculture prohibiting the transportation by interstate commerce of game killed in violation of local laws, and for other purposes."

Is that the same law?

Mr. MERRIAM. That is it. That is the Lacey Act. But the task of inspecting importations and granting permits is only one part of the work put upon us by this act. We have jurisdiction over the game animals of Alaska, and over the illegal interstate shipment of game. We publish synopses of the game laws of all the States and keep them down to date. We get out a revised edition at least once a year of all the game laws of all the States and Territories; and we have to cooperate with the Department of Justice in making prosecutions. It is such a new business for them that they are not able to handle it alone. They call on us frequently, and one of our men is up there a great deal. Many seizures are made, more in Chicago than anywhere else, of quail and other game shipped in violation of State laws. Sometimes 50,000 quail are shipped to Chicago illegally from points down the Mississippi River.

The CHAIRMAN. The question arises, How does the United States Government go in and seize those birds? Suppose the local government says it is legal; suppose the game laws of that State permit the selling of quail?

Mr. MERRIAM. If the game laws of the State permit the capture and shipment of quail, either alive or dead, the Government has nothing whatever to do with it: but under the Lacey Act, if the laws of the State make it illegal to ship, alive or dead, quail or any other game, then, under the interstate part of the Lacey Act, we prevent the shipment of that game—that is to say, we can hold it up at any point in transit and prosecute the shipper, if he can be located; and that has been done in a great many cases.

The CHAIRMAN. You can not go into Chicago, then, and seize game, can you?

Mr. MERRIAM. Yes; the marshal at Chicago has seized many thousands of game birds there.

Representative SCOTT. Does he have to find out, before making that seizure, the State from which the game comes, and find out what its laws are on the subject?

Mr. MERRIAM. Yes; and he does that largely through the express companies. There has been a good deal of trouble. The law requires that game packages shall be marked in a certain way, and that law has been evaded. Game has been shipped in other kinds of packages and delivered in other ways, but in many cases the shippers have been detected and prosecuted.

The CHAIRMAN. There is no doubt about the constitutionality of the act, then? It has been tested, has it?

Mr. MERRIAM. It has never been questioned, so far as I know.

Representative DAHLE. For instance, are deer shipped in boxes?

Mr. MERRIAM. Yes; game is often shipped in boxes and sometimes in coffins.

Representative DAHLE. In coffins?

Mr. MERRIAM. Yes, shipped in coffins, just as a corpse would be shipped, and even such shipments have been detected by sharp game wardens. Deer and elk and moose and all big game shipped in violation of the law of the State in which the game is killed are liable to seizure, and the shippers to fine.

Representative GRAFF. Do you have supervision over anything except birds?

Mr. MERRIAM. Oh, yes; all game animals.

Representative GRAFF. Bear?

Mr. MERRIAM. The only case in which we have anything to do with bear is in Alaska. The Alaska game law is under our supervision. We are charged with the enforcement of it so far as possible, and it is a very good law for the first attempt. It is very hard to enforce it, as we have no money to employ wardens anywhere. In Alaska where moose are butchered there is no authority to arrest anyone or do anything with him if he is arrested, except take him to the nearest port, which is a long ship journey. There ought to be some warden there empowered to make arrests and to make some disposition of the person arrested. There is no machinery for carrying out the law now except to spot the illegally shipped game when it arrives on the steamers at Puget Sound or San Francisco.

Representative SCOTT. Can you give an estimate of the number of importations and inspections at the various ports, or in the aggregate?

Mr. MERRIAM. No; I can not. I could give you those figures in my office. I haven't them in my head.

The CHAIRMAN. Approximately?

Representative HAUGEN. Approximately how many?

The CHAIRMAN. For instance, approximately how many at New York?

Mr. MERRIAM. I really do not know. There are a very large number in New York.

Representative HAUGEN. A thousand?

Mr. MERRIAM. I can not give you the number. No; not a thousand different inspections, but thousands of birds are inspected.

Representative HAUGEN. How many inspections are there?

Mr. MERRIAM. I do not know. The number of permits issued is very large also. A permit has to be had from our Department to bring in any mammal or bird not on the exempted list, and these permits are generally secured in advance. As a rule the importers notify us that they expect such and such a consignment on such and such a steamer, and we issue the permit in time so that it is in the hands of the customs officer in New York before the arrival of the ship. But if a passenger brings in something and does not know that there is a law preventing it he is directed by the customs officer to wire us for permission to enter such an animal or bird, designating it by name, and we wire authority to the collector of the port and send the permit by mail the same day.

Representative DAHLE. Are such animals inspected?

Mr. MERRIAM. They are inspected by the local inspector if the Treasury man has any doubt about what it is.

Representative DAHLE. And the importer himself pays for such inspection?

Mr. MERRIAM. He pays for it; yes.

Representative DAHLE. He pays $5, even though it is only one bird?

Mr. MERRIAM. Even though it is only one bird.

Representative DAHLE. But suppose it is a thousand birds?

Mr. MERRIAM. It would be the same, $5.

Representative DAHLE. Does that appear to you to be the fairest way of inspection? We have State inspections of kerosene oil in our State and an inspector is appointed by the governor, but he is paid so much a barrel for every barrel he inspects.

Mr. MERRIAM. Our inspectors are busy business men. When one is sent for he has to drop his business and go down to the wharf and spend two or three hours in making this examination. He has to go whenever he is summoned. It makes little difference to him whether he inspects one bird or a thousand. He has to make the trip.

Representative DAHLE. It is done very rapidly, I suppose?

Mr. MERRIAM. Yes; very rapidly. He simply has to pass the birds or animals under his eye. The importers learn how to arrange them so as to facilitate the inspection.

Representative GRAFF. The difference between a big inspection and a small one is not material?

Mr. MERRIAM. No; it is not material, except in the case of the very largest importations. There have been two or three enormous importations which have taken a great deal of time, but ordinarily it is a small matter and takes but a short time.

Representative GRAFF. The time is taken in going and coming?

Mr. MERRIAM. In going down there and back again and signing the necessary documents.

The CHAIRMAN. For instance, in New York, who are your men there? Who have you?

Mr. MERRIAM. William Dutcher, an insurance man, is one of them;

Frank M. Chapman, of the American Museum of Natural History, is another one, and George K. Cherrie is the third.

The CHAIRMAN. Is Dutcher a sort of amateur enthusiast, an amateur expert in this business?

Mr. MERRIAM. He is a well-known ornithologist. He has been treasurer of the American Ornithologists' Union for about ten years, but is not a professional ornithologist. That is, he does not make his living that way.

The CHAIRMAN. It is a hobby with him?

Mr. MERRIAM. It is a hobby, but he does not make his living that way. He is one of the principal men interested in the preservation of small birds in this country.

The CHAIRMAN. Now, move along in your subject.

Mr. MERRIAM. This inspection of importations is only one feature of our work, of course, and one of the newer ones. Under a recent act we have charge of the game laws of Alaska. We feel the need of a paid warden at one or two points in Alaska, especially on the Kenai Peninsula. Men go in there to hunt big game from all over the world. Two or three Englishmen were there this year. Men go from various places because there is no other place in the world where they can get right into the midst of big game as easily as there. A man can see, perhaps, 500 white sheep in one day after going only about two days from shore. He can see the enormous Alaska moose, the biggest of the deer tribe living in the world. He may also see the caribou; and he stands a fair chance of getting the big Alaska bear there.

Representative DAHLE. You do not need any change in the law applying to Chicago, for instance? The way you work there is as good a way of working as you can work and does help in the preservation of the game?

Mr. MERRIAM. Yes; the law does help enormously. We have been criticised for interfering with the shipment of live game, but we have never in any way interfered with the shipment of live game that was not captured or shipped in violation of State or Territory laws—the laws of the State or Territory from which it was shipped.

In the division of our work relating to economic ornithology, we have been examining the contents of birds' stomachs and studying the food habits of birds in the field for seventeen years. We have a small force of experts who spend their entire lives in this work, in finding out just what each kind of bird, which there is reason to believe is worth taking into account in connection with agricultural pursuits, is eating, and what it is eating in different parts of the country and at different times in the year. We have examined in all now more than 22,000 birds' stomachs, and we publish bulletins on the food of particular birds and particular groups of birds with which, I suppose, many of you gentlemen are familiar.

The CHAIRMAN. That is really the commercial side of your investigation?

Mr. MERRIAM. It is the side which relates to practical agriculture.

The CHAIRMAN. The commercial side?

Mr. MERRIAM. Yes; it shows the farmer what birds are of interest to him on the farm, what birds are injurious to his crops, what birds are beneficial to his crops, and how he can contend with species which are injurious at one season and beneficial at another season. In many cases a bird may be injurious for a brief part of the year, for a month or two, or a few weeks, and beneficial for ten or eleven months of the year, so that the aggregate of its food habits are very much in its favor.

The CHAIRMAN. You can not control that. There is no power to control that. You can not drive it away?

Mr. MERRIAM. No; but you can often protect the crops from its depredations.

Representative HENRY. What bird, for instance, do you refer to?

Mr. MERRIAM. For instance, the tarring of seed corn will prevent the crow from pulling it.

Representative HENRY. You do not regard him as being a troublesome bird?

Mr. MERRIAM. Not on the whole. It is only in the season when corn is coming up; and he is beneficial during the greater part of the year. We have examined a very large number of crows' stomachs and find that the balance is immensely in favor of the crow. Some of the fruit-eating birds in California feed on a certain crop for a very short period, and their food habits during all the rest of the year are a benefit to the fruit growers. Some birds that were supposed to be eating buds were found to be eating insects that were infesting the buds.

Representative GRAFF. What do you mean by tarring the seed corn? Do you mean dipping the corn, before it is planted, in the tar?

Mr. MERRIAM. Yes; it is generally done by stirring in tar and afterwards rolling it in a barrel with ashes or dry dirt to coat it, so it will not be sticky.

Representative GRAFF. Do the crows dig up the corn?

Mr. MERRIAM. Yes; they dig it up and eat it, and they do not like the taste of tar.

Representative HENRY. If there is any slight covering of tar, the crow does not like it and he will pull a few stalks and stop.

Mr. MERRIAM. We found in California there were several birds supposed to be injurious by eating certain fruits which proved to be immensely beneficial. We found that some of the little titmice in California feed on the black scale insect, the olive scale insect. They feed on them largely, and some of the orioles feed on them. In the East the quail destroys more chinch bugs than any other birds, so far as we know, and is entirely capable of holding the chinch bug in check where it is protected and allowed to reproduce in sufficient numbers. It is one of the most beneficial birds on the farm—the ordinary quail.

Representative DAHLE. Is the chinch bug now troublesome in any part of the country?

Mr. MERRIAM. Oh, yes; over quite a large area. It is a very destructive insect. We have birds that feed on the coddling moths, plenty of them, and on most injurious insects.

Representative HENRY. The quail feeds on the potato beetle?

Mr. MERRIAM. Yes; the quail eats the potato beetle, eating more and more every year. At the time of our early investigations the rose-breasted grosbeak was the only bird we found feeding on the potato bug to amount to anything, and it did not appear to eat many, but during the last few years we have found it, like the quail, eating more and more. Unfortunately, it is rather a scarce bird and has such bright plumage that it is killed by the small boy.

Many of the woodpeckers are immensely beneficial in forested areas. Woodpeckers that have been accused of destroying timber have been found to be attacking trees only to secure the bugs and grubs that were destroying the timber. Mr. Hopkins, the entomologist, in his investigations of forest-destroying insects, has secured a very large amount of evidence as to the benefits woodpeckers do in this way, in reaching insects that can not be reached in any other way now known; so that they should be preserved wherever possible in the wooded districts. Yet there is one woodpecker that does harm; one of the sapsuckers. Similarly with hawks and owls. We found that out of more than seventy different kinds of hawks and owls in this country, only four or five eat poultry. The others live on the enemies of agriculture—on grasshoppers, mice, and small rodents that are such pests to agriculture. But there are two or three kinds that always eat chickens whenever they can get them. These should be killed. We try to furnish the farmer with illustrated reports showing what birds should be destroyed and what preserved.

Representative GRAFF. Do you know any way, Doctor, that you could keep crawfish from eating corn after it has gotten up a little on low land?

Mr. MERRIAM. No, I do not.

The CHAIRMAN. I dare say that tar would stop them, too.

Representative GRAFF. The tar would not affect the young corn. They feed, I think, on the blade.

The CHAIRMAN. They feed on the blade only, do they, Professor?

Mr. MERRIAM. Yes, I think they feed on the blade. Perhaps they may feed on the corn itself.

The so-called jackdaw, the largest blackbird of the Gulf States, feeds on those crawfish and does a great deal of good that way. The crawfish cut down the rice plants in the rice fields along the Gulf coast, particularly in Texas. We found that there were men down there slaughtering these birds by the thousand for the millinery trade, and other men buying up the birds and getting small boys to kill them.

The CHAIRMAN. For the wings?

Mr. MERRIAM. For the plumage, to be used in decorating hats. They are a most beneficial bird.

Representative HENRY. Did you say the rice bird?

Mr. MERRIAM. No, this is not the rice bird. This is the jackdaw. It is a big blackbird, with resplendent plumage. It is larger than our Northern blackbirds. It feeds on the crawfish that cut off the rice there, and in that way does a good deal of good.

The third branch of the work of the Biological Survey is the Biological Survey proper, which studies the geographic distribution of animals and plants, and maps the natural crop belts and areas throughout the country.

We find that animals and plants are not scattered promiscuously over the land, but grouped in definite belts and areas. In California, for instance, in going from the interior valley, the San Joaquin-Sacramento Valley, which is about 500 miles long and nearly 100 miles broad, up the slope of the great Sierra chain of mountains, there are half a dozen distinct belts, each characterized by different associations of plants and animals. Each of these belts is adapted, by its peculiar climatic conditions, to peculiar requirements of animal and vegetable life—to particular varieties of cereals and other crops and fruits, and to particular kinds of stock.

We find that these belts owe their existence to climatic conditions, which in turn are governed largely by altitude and topography—the conformation of the land. The most important climatic factors are temperature and humidity. We have found that the temperature concerned is not the mean annual temperature, but, for species or crops having a southern origin (that come from tropical or mild climates), is the total quantity of heat during the season of growth and reproduction; that for native species and crops which have a more northern origin, it is the mean temperature of a short period in the hottest part of the year which checks their southward extension.

In the case of humidity we have to consider at least three factors—rainfall, actual humidity, and fog. Fog acts in two ways: By bringing moisture in contact with the plants and the surface of the earth, and by cutting off the sun's rays and interposing a cold blanket between the sun and the growing plant. In the coast ranges of California there are a large number of more or less parallel valleys which, in receding from the coast, receive different quantities of fog. In studying the distribution of animal and plant life in these valleys and on the adjacent mountain slopes we find certain associations that repeat themselves at particular distances from the sea. The usual rule is, that in retreating from the coast toward the interior the fog decreases and the heat increases; that in crossing each mountain range there is less fog and more heat, but in certain cases this order is reversed, because in places great rivers of fog penetrate far into the interior and give off side streams in both directions.

At Monterey Bay, for instance, is a broad gap, through which at certain seasons a large volume of fog comes every day and flows up the open Salinas Valley, a great valley about 10 miles wide and 70 or 80 miles long. It flows up the entire length of this valley in a great river of fog perhaps 500 to 800 feet in thickness, and overflows on both sides (both toward the interior and toward the sea) through all the canyons and little side valleys, forming lakes of cloud in the tributary valleys on both sides. Thus valleys lying parallel to the Salinas and next to it on the west side (that is between it and the coast) receive in this roundabout way very much more fog than valleys still nearer the coast. This is because of the existence of gaps which admit the fog freely from the main Salinas trunk, while the valleys nearer the coast are separated from the coast fogs by a continuous barrier of mountains. As a result of these cool fog blankets, Claus Spreckles has established the largest beet-sugar industry in the United States, and the inhabitants have established profitable orchards of hardy apples in parts of California having the same altitude and latitude as other parts in which citrus fruits and the raisin grape are the dominant crops.

This is one of many complicated cases that we have to take into account in our studies; but the object of it all is to find out what areas are adapted to particular varieties of fruits or other crops. You know there are a great many varieties of cherry, a great many of peaches, of apricots, and apples, and grapes, and olives, and so on, and that each of these varieties is adapted to a certain combination of climatic conditions, mainly of temperature and humidity. In some cases suitable conditions prevail over large areas, but in the case of some of the choicest varieties of fruit only one or two localities, so far as known, possess the necessary climatic features. For instance, in a small valley near San Francisco the grapes formerly grown there brought only $10 an acre. It was then ascertained that the climate was adapted to a particularly choice variety, and now grapes are produced there which bring $300 per acre.

In our Biological Survey work we examine the chaparral of areas that produce particularly desirable crops—we find out what bushes and birds and mammals live in these places—and then in traveling north or south or east or west where we find repetitions of these same species we know that the temperature and humidity conditions are the same, and that the same valuable varieties of fruit can probably be grown at a commercial profit there.

The regular work of the Biological Survey proper consists in ascertaining what species, and what combinations or associations of species of birds, mammals, and woody plants occur naturally in different parts of our country, and in finding out what varieties of crops do best in each of the areas and belts so determined. We have been doing this for a number of years and have completed a rough reconnoissance of the whole United States. Just now we are doing more detailed work on the Pacific coast, because the physical features of the Pacific coast are more diversified, and the horticultural products more valuable than those of any other part of the country. Of oranges alone California ships east more than 20,000 carloads a year, and could ship many more if they could get the cars.

The CHAIRMAN. Do I understand that you can determine the availability of a piece of land for a certain variety of crop by the bird inhabitants, if I may put it so?

Mr. MERRIAM. Certainly; that is exactly what we are doing—by studying the birds and mammals and plants (the woody plants, not the herbaceous plants). In California there are localities where oranges mature in November; there are other areas where the main crop begins to mature in January and continues to ripen from January until April, and there are still other areas where oranges ripen in July and August. We search for repetitions of the local faunas and floras of each of these areas so as to find out the places where the fruit grower may plant his oranges in order to have them ripen at times of the year when the market is least supplied and the price is highest. The same thing is true of many other fruits also. Cherries ripen in certain valleys in California as early as the latter part of February and through March and April, while in other parts of the State they ripen in May and June.

It is so with nearly every kind of fruit. Not only are there areas adapted to particular varieties of fruit, but within the areas adapted to these varieties there are local combinations of climatic conditions that enable the crop to develop months earlier or months later than the same crop will develop in other parts of these areas. This, it goes without saying, is of enormous commercial consequence, particularly to the farmer who gives heed to the study of commercial geography.

Representative HENRY. Do those conditions you have described in California prevail in other sections of the country—similar conditions as to fruits?

Mr. MERRIAM. Yes; but not on so large a scale, and they are not so sharply marked. In California we have every climatic combination that one can conceive of, except the actual humid tropics. We have in California the hottest part of our country. We have in the Death Valley region the hottest and most arid areas in the whole world, hotter and dryer than the desert of Sahara and the deserts of Arabia and India. We have also areas of very heavy rainfall, where the rainfall reaches 100 inches.

We have areas in the mountains of California where frost occurs not only every month in the year, but every week in the year and every day in the year; we have areas where fog is unknown and areas where fog prevails throughout nearly the whole year. In short, excepting the Tropics, climatic conditions that can be found anywhere can be found in the State of California. This is due to its large size, favorable situation, and the wonderful diversity of its topography. In California the high ranges run parallel with the sea, so that the temperature belts and agricultural belts instead of running east and west, as they do throughout the continent generally, are deflected and run north and south. If a ranch extends, as many of them do, from the valley up over the foothill region into the mountains, a man can raise oranges, and limes and lemons and raisin grapes and figs on the lower parts of his ranch, and he can raise hardy apples and hardy cereals on the upper part.

The CHAIRMAN. It is a question of altitude?

Mr. MERRIAM. It is a question of altitude and climate, and climate is largely determined by altitude.

This is the main work of the Biological Survey. It is a work that I conceive to be of vastly more importance than anything else the Biological Survey is doing, although its other branches of work are of a good deal of practical interest to agriculture also, particularly the study of the food habits of birds. We propose to put into the hands of the farmer maps which will enable him to tell beforehand what crops will grow with a good prospect of success on his lands, and what crops it is perfectly useless to attempt to grow.

The CHAIRMAN. In the first place, the Bureau of Soils, I suppose, has to tell a man whether his soil will fit that crop. Then you can tell him from other proofs whether it will thrive or not?

Mr. MERRIAM. Yes.

The CHAIRMAN. Is there not a duplication of work where the Bureau of Soils has to tell him he can and you have to tell him he can also?

Mr. MERRIAM. We do not study the soils, but we study the natural distribution of plants and animals, and where we find repetitions of the same plants and animals we infer the same crops will grow and flourish.

The CHAIRMAN. Our great point is that the Bureau of Soils should do that, should tell a farmer what part of the crop he must plant on a certain part of his farm.

Mr. MERRIAM. Unless he knows the climatic conditions beforehand that would be worthless.

Representative DAHLE. Are you going to consider California principally, mostly, or about altogether, or are you going in, for instance, the Mississippi Valley and the country around the lakes?

Mr. MERRIAM. We have already, in a preliminary way, worked the Mississippi Valley and the country around the Great Lakes, and in fact every State and Territory in the Union. We are now paying special attention to California, Oregon, and Washington because of the enormous value of their horticultural products, and because we feel that we can be of more service to them by pointing out the particular areas in which they can grow the most valuable crops, crops that will give the largest yield in dollars and cents per acre.

Representative SCOTT. Do you think your method of pointing out the localities in which crops can be grown is more reliable than the method of the soil survey?

Mr. MERRIAM. It is the broad, comprehensive method that determines the limits beyond which a particular crop can not possibly thrive.

The soil survey is a matter of small details within these belts that we must determine. It does not do much good to know that you have the same kind of soil in Florida that you have in northern New York unless you know the climatic limitations to plant growth. Suppose you have identical soils. No member of this committee would imagine that you could raise in northern New York oranges or other subtropical fruits that grow in southern Florida even if the soil has exactly the same physical properties. The difference in climates bars that. It is the distribution of crops and of life generally in accordance with climatic control that we are studying, while they are studying the details of soil, which are useful only when you know the climatic belt in which the soil repetitions occur.

Representative SCOTT. You think your work does not eliminate theirs?

Mr. MERRIAM. No; theirs is a work of detail after our belts are determined.

The CHAIRMAN. They do not wait for your determining, though, do they?

Mr. MERRIAM. No; they take a spot here and a spot there and examine the soils.

Representative SCOTT. They take judicial notice of the fact that there is a certain belt and territory adapted in a general way to the production of certain crops?

Mr. MERRIAM. Certainly.

Representative SCOTT. Then there is the knowledge that every one has. You said a moment ago any one, even a member of this committee, would know better than to attempt to grow the same crop in northern New York that he would grow in Florida.

Mr. MERRIAM. Another important feature of the work is in predetermining, predicting in advance, the route likely to be taken by destructive insects in passing from one part of the continent to another. The entomologist takes our map, and if there is an outbreak of an injurious insect that is destroying crops, he tells the people along certain belts where this insect is progressing that they will be troubled by it, and that they had better prepare to fight it or else plant other crops for the time being, so as to avoid its depredations. Every insect that spreads from one part of the country to another spreads in a definite belt. He does not spread haphazard. This is one very important use of our zone map.

The CHAIRMAN. Doctor, what is the real actual need of giving you $10,000 more. What line of work do you want to enlarge on?

Mr. MERRIAM. We need this increase to handle the additional duties put upon us by the Lacey Act and the Alaska game bill, to enable us to do more field work and do it more effectively and economically, and to readjust the salaries of some of our men. I think you are all aware that the Biological Survey is not on a footing with the other divisions of the Department at all in its salaries. Until last year we had received no increase in appropriations for eight or ten years and were paying men salaries several hundred dollars lower than the salaries given for equivalent service in the other divisions. We are very much handicapped in our field work, because we never have money enough available in one year to finish a job. Each season we make allotments for the several parts of the country where we are working. When the man in charge of a party gets into the field with his field force the additional cost per month is comparatively small, but he has to stop when he has spent his allotment, usually in three or four months, when if he had a little more money he might have worked eight or ten months. It is an uneconomical way to do the work.

The CHAIRMAN. I take it, perhaps, the commercial value of the Biological Survey is not so tangible, not so direct as some of the other bureaus, and perhaps Congress is more willing to let it go on, recognizing its value, but let it go on more slowly, perhaps.

Mr. MERRIAM. The condition we are in is that assistants of a certain rank and grade in our office are getting $1,200 and $1,400, while the same kind of men are getting $1,800 or $2,000 or more in other divisions of the Department and in places outside, and we are continually losing good men.

The CHAIRMAN. What are these good men doing? What other employment did they seek or get?

Mr. MERRIAM. They are both field men and office men.

The CHAIRMAN. What employment did they get at a larger salary?

Mr. MERRIAM. They get similar employment elsewhere.

The CHAIRMAN. From private business enterprises?

Mr. MERRIAM. No; in other departments of the Government service or in schools and colleges. Schools and colleges have taken a number of our men.

The CHAIRMAN. That is a good purpose We ought not to discourage that. That does good.

Mr. MERRIAM. Yes; but the loss of our trained men handicaps us very seriously.

The CHAIRMAN. Still, you are doing good all the time.

Mr. MERRIAM. One of our field men, who gets $1,400 and pays his own expenses, was offered $1,800 and expenses last week.

The CHAIRMAN. Was that by an educational institution?

Mr. MERRIAM. No; that was not by an educational institution. It was in connection with investigation work, work carried on as it happens under one of the Department officers.

The CHAIRMAN. Under the same Department, the Department of Agriculture?

Mr. MERRIAM. Yes; but the money was to be paid by the Department. The money came from an outside source, but the investigation is under the charge of one of the Department officials.

The CHAIRMAN. The Department is educating a number of scientific aids, giving them salary enough to live on and at the same time giving them a post-graduate education?

Mr. MERRIAM. Yes; that is true, in certain divisions.

The CHAIRMAN. Have you any of those scientific aids at all?

Mr. MERRIAM. No; we have never been able to get any. We have advertised for them several years, but have not been able to get them. We have to train our own men.

The CHAIRMAN. I suppose really the trouble is that outside of the Government and outside of educational institutions there is not much commercial need of ornithologists?

Mr. MERRIAM. No; but ornithology is only a very small corner of the work we are doing.

The CHAIRMAN. I mean the survey and all that sort of thing. There is not much chance of corporations employing these men?

Mr. MERRIAM. No; the demand is mainly from museums and educational institutions.

The CHAIRMAN. Yes; principally.

Mr. **Merriam.** The demand for men of the kind we are training is constantly increasing.

The **Chairman.** Why do you not get some of these scientific aids? I believe you stated, however, that you could not get any of them.

Mr. **Merriam.** No; the agricultural colleges do not train men so that they are equipped for our work, and we have to find men who are attracted to it and have done a certain amount of it, so that they can be useful to us. We take them wherever we find them, whether they come from agricultural colleges or not, and even in some cases where they have no college education at all. We have great difficulty in getting the kind of men we want—very great difficulty.

The **Chairman.** I can see that you would find some difficulty in finding men who would take up this line of work because the opportunities are not great for their receiving training in that direction.

Mr. **Merriam.** It requires special training and aptitude.

The **Chairman.** The opportunities for the future are not very great?

Mr. **Merriam.** They are increasing all the time.

The **Chairman.** The opportunities?

Mr. **Merriam.** Yes; they are increasing all the time.

The **Chairman.** For a young man?

Mr. **Merriam.** Yes; a young man in the natural sciences, if he is a good man, will have no difficulty in getting employment now.

The **Chairman.** Still you do not seem to get any applicants in your own case?

Mr. **Merriam.** No; because we can not pay enough. They are taken from us, but will not come to us unless they value opportunity higher than salary. We have again and again had a man take a $1,000 place with us at the same time he was offered $1,200 or $1,400 elsewhere. He came to us on account of the increased opportunities he would have here and the advantage of training under our best men, but our best men are continually receiving offers to go outside.

The **Chairman.** You have a man at $1,800, two at $1,500, one at $1,400, four at $1,200, biologists?

Mr. **Merriam.** Yes, sir; most of these came in last year under last year's appropriation, which enabled us to make a beginning.

The **Chairman.** What did we increase your salary roll last year—what total increase?

Mr. **Merriam.** The total increase was $10,850. We made a number of transfers and readjustments, but we did not get through with the list.

The **Chairman.** Then you have a biologist on your lump-sum roll to whom you paid $2,250, one at $2,000, one expert at $900. What is that expert?

Mr. **Merriam.** We pay the $2,250 to Dr. Palmer, who has charge of the game-protection matter and all matters under the Lacey Act.

The **Chairman.** And the assistant at $2,000?

Mr. **Merriam.** The $2,000 is paid to Professor Beale, who has had charge of the economic ornithology work, examining the contents of birds' stomachs, for the last twelve or fifteen years, and who is the leading authority in the world on that subject.

The **Chairman.** Why do you keep those two places on the lump-sum roll?

Mr. **Merriam.** I have asked to have the biological survey reorganized and have our three divisions recognized with equivalent salaries, but that was not put into the estimates this year. The Secretary did not care to ask for any changes in the salary roll.

The CHAIRMAN. You want to make it a bureau?

Mr. MERRIAM. I want to make it a bureau on a footing with the other bureaus, which would cost just $3,500 above the present appropriation in the statutory roll. It would cover everything we ask for in the way of salaries.

The CHAIRMAN. Of course, if you put that $2,500 on your statutory roll he would rank your assistant at $1,800?

Mr. MERRIAM. The first assistant gets only $1,800 by law, and he has always been restricted to that.

The CHAIRMAN. You have another assistant at $2,000. He would rank your present assistant?

Mr. MERRIAM. Yes; the first assistant ought to get more money, but he has always been held down to that by law. Dr. Palmer used to be first assistant, but this year we put him in charge of the work under the Lacey Act and gave the first position to Dr. Fisher.

The CHAIRMAN. If the bill remains in the same form it was in last year you could not transfer those men to the permanent roll without destroying your idea of rank?

Mr. MERRIAM. We can not transfer them to the permanent roll until we get a reorganization, but I will present a plan of reorganization whenever the Secretary will give it to the committee. What we desire is simply a logical classification comparable to the classifications in other divisions. The actual increase involved is only $3,500.

The CHAIRMAN. Is there anything further that you wish to tell us, Doctor?

Mr. MERRIAM. I think not. I should be glad to answer any questions.

The CHAIRMAN. Is there anything which you yourself want to tell us about?

Mr. MERRIAM. I think not. I am obliged for the opportunity of explaining the three independent lines of work we are doing.

The CHAIRMAN. Doctor, we are very much obliged to you.

The committee (at 4.25 p. m.) adjourned until Tuesday morning, December 16, 1902, at 10.30 o'clock.

SUBCOMMITTEE OF COMMITTEE ON AGRICULTURE,
HOUSE OF REPRESENTATIVES,
Washington, December 16, 1902.

The committee met at 10.30 o'clock a. m., Hon. J. W. Wadsworth in the chair.

STATEMENT OF GEORGE W. HILL, CHIEF OF THE DIVISION OF PUBLICATIONS, DEPARTMENT OF AGRICULTURE.

The CHAIRMAN. Gentlemen, Mr. Hill is here and wants to be heard a little while. The Division of Publications is on page 21, and Mr. Hill is the head of that division.

Mr. Hill, the first change in your Division of Publications is an estimate for an increase of salary of $500?

Mr. HILL. Yes, sir.

The CHAIRMAN. Do you want to be heard on that proposition?

Mr. HILL. I would like to say a few words about that. It is a little embarrassing to have to speak for myself, but I would like to give just a few facts.

The CHAIRMAN. Very well.

Mr. HILL. The first one of which is that sixteen years ago, before I entered the Government service, the salary recommended by the Secretary was the salary I was getting. I was the manager and editor of a paper. I entered the Government service in July, 1889, as editor, having made an arrangement with the then Secretary at my present salary. The work at that time was very light. I had one assistant and a stenographer, and we issued 75 publications during the year. The total amount of money that was expended under my supervision was a trifle under $40,000. In two or three years it increased very largely. I had a staff of two or three assistant editors. We issued two hundred and more publications during the year, and I was supervising an expenditure of about $100,000, which we thought was a very great increase. Last year we issued 757 publications, and the sum expended under my supervision was $380,000, and in the meantime, in addition to all the editorial work, there has been added to my supervision a lot of branches that did not belong to it and that I was not hired to attend to at my present salary.

In the first place, we had a division of illustrations, which was abolished. The chief was retired, and instead of appointing a new chief in his place the whole division was turned over to me, as a measure of economy, by Mr. Morton. Then the printing bill of January 12, 1895, required the Secretary of Agriculture to appoint an officer of his Department who should have entire supervision of the branch printing office, which previously had been under the chief clerk and was a very small affair. The Secretary named me for that position, and, while it was not very arduous at first, involving the issuing of 500 or 600 requisitions during the year, and the supervision of all the official printing of the Department, which was a new feature—I had had nothing to do with that before—last year it involved the issuing of over twenty-five hundred separate requisitions for work. So greatly has the Department developed since that time that it now keeps three or four of my people busy, under my supervision, for that one thing.

The next thing that printing bill did was to require the Secretary to place some responsible officer in charge of the distribution of documents—something I had had nothing to do with—and that immediately added to my force 50 to 60 people. That force is now increased to over 120, and the number of publications that I distributed when that law first went into effect, or that were distributed under my supervision, was 4,000,000. Last year it was 10,500,000. The work has gone on increasing all along the line, both editorially and by the accretion of these other things. At times I have had the supervision of 160 people. It never is less than 130, according as the business fluctuates.

I just venture to suggest to you gentlemen that I do not think there is any other line of business in the world where a man's duties and responsibilities would increase so rapidly without its being regarded as a proper thing to increase his remuneration somewhat, and to me of course the sum seems rather modest. I am nearly fifty-seven years old, and the Secretary is asking for what I was getting when I was 40.

The CHAIRMAN. How many people do you say you have in your employ now?

Mr. HILL. I have had as many as 160. There are about 140 now—between 140 and 150.

The CHAIRMAN. You have quite a force of temporary people, do you not?

Mr. HILL. They are temporary in this way: They are generally temporary because they are drafted away from me to fill other emergencies as I can spare them. People are always wanting copyists, watchmen, and one thing and another of that kind, and my force being more or less elastic, owing to the great influx of business sometimes and a lightening up at other times, it has become customary to call upon me to help in these emergencies. There is very seldom a time when there are not five or six of my people, and from that to more, detailed somewhere here or there. It is almost impossible in a department like ours to make an estimate in September of one year for the twelve months beginning the 1st of July next which will be crystallized and cover everything.

Representative DAHLE. Do we have several divisions who have one chief editor, the same as you?

Mr. HILL. No, sir; there are editorial clerks in some of the divisions.

The CHAIRMAN. He has an associate editor and two assistant editors and two editorial clerks.

Representative DAHLE. Yes; I noticed that.

The CHAIRMAN. Those might be termed the professional people.

Mr. HILL. They are the strictly professional people; and then different bureaus assist in the work by having an editorial clerk, whose relations with me are very close, and it facilitates the mechanical part of the work very much.

Representative SCOTT. Who is your associate editor?

Mr. HILL. My associate editor is Mr. Joseph A. Arnold.

Representative SCOTT. And your assistant?

Mr. HILL. The first assistant editor is Mr. Benjamin Stallings.

Representative SCOTT. You have a man there by the name of Thompson, have you not?

Mr. HILL. Thompson is the editorial clerk of the Bureau of Animal Industry. He graduated with me.

The CHAIRMAN. I see you have paid from your lump-sum appropriation an engraver at $1,600.

Mr. HILL. Yes.

The CHAIRMAN. Who is that?

Mr. HILL. Lewis S. Williams. He has been in the Department for a long time.

The CHAIRMAN. What does he do?

Mr. HILL. He is a wood engraver and he is doing our photographic work. He has taken that up as we began to have less wood engraving. We dismissed one wood engraver some years ago.

The CHAIRMAN. How old a man is he?

Mr. HILL. He is a man, I should judge, about 36, or 38, or 39.

The CHAIRMAN. One artist at $1,400?

Mr. HILL. That is our first artist, who has supervision of the illustration work. He is a skilled artist. Then we have two other artists.

The CHAIRMAN. You have one artist at $1,000, one draftsman at $840, one at $2,000. What is that?

Mr. HILL. He is the highest-paid man we have except the associate editor. He is on the farmers' bulletin roll. We have two or three editors on that farmers' bulletin roll. The preparation and editing of the farmers' bulletins involves a good deal of editorial work; but they are available for miscellaneous editorial work at other times. When I tell you we edited last year 50 per cent more matter than we did in any year previous, and that there is not a single one of these men who is not obliged to do an amount of extra work more than equal to his thirty days' leave——

The CHAIRMAN. New matter furnished by the different bureaus?

Mr. HILL. By the different bureaus. Of the 757 publications issued last year 355 were new publications entirely, and we edited in my office last year as much new matter as would run one of the leading magazines of this country for fifteen years.

The CHAIRMAN. I notice the President calls attention to the fact that we are publishing a good many things. The printing bills of this Government are getting to be rather enormous.

Mr. HILL. We have been, I think, a little erring in the matter of illustrations. We do try to keep down illustrations.

The CHAIRMAN. They please the farmers' children, you know.

Mr. HILL. Yes; but my idea is not to do what is ornamental, but what is useful; but when it comes to printing the matter, it is you gentlemen who are responsible for that.

Representative WILLIAMS. I notice that in some of the publications instead of illustrating what they are doing, they put in the pictures of the people who are doing it.

Mr. HILL. That is done very often in order to give an idea of the relative size of things. People have a pretty good idea of what a man's height is, and every once in a while they take a man's photograph standing in a particular place.

Representative WILLIAMS. I am not talking about the picture of a man standing by a field in which a cane crop is growing, but there is sometimes a picture of the people who did the work. This good-roads concern has a picture of the delegates to the good-roads convention. How can that help the farmers of the country?

Representative SCOTT. Perhaps that is to illustrate the interest which the convention attracts.

The CHAIRMAN. I see that the good-roads convention in the Northwest was a dead failure. They had to abandon it.

Mr. HILL. We are doing ten times the illustrating we used to do for less expense.

Representative HENRY. And very much better?

Mr. HILL. Very much better. When I first went there the illustrations cost more than they do now, with 757 publications. You see, the men feel as if that gives them leeway. My business is to keep them in check. The theory I try to work by, the line I lay down to hew to, is that no illustration ought to be admitted into a book that is not of great assistance to the reader in apprehending the text.

Representative HENRY. The illustrations popularize the matter that is in the book and illustrate it and make it more plain to the average reader.

Mr. HILL. If it does that, it will pay.

The CHAIRMAN. Here is a photograph in this publication of the evaporator of J. T. Wells.

Representative HENRY. That explains the evaporator better than a whole page of print would explain it.

The CHAIRMAN. I do not think so. That is simply a plain box with a photograph of Mr. Wells. I do not think that explains the evaporator. It shows simply a tank which might be a watering tank for horses or a dipping tank for sheep.

Representative HENRY. Your average constituent will see more in that cut than in a lot of reading matter. I am decidedly in favor of these illustrations.

Mr. HILL. They do popularize. They attract attention.

The CHAIRMAN. Here is a cane field in this photograph, in line with what Mr. Williams called attention to.

Representative HENRY. That would not mean anything to Mr. Williams, but you take a Northern man who never saw a cane field and it means a good deal.

Mr. HILL. There is no question bu that you can find publications with excessive illustrations.

The CHAIRMAN. That all increases the cost, does it not?

Mr. HILL. That increases the cost.

The CHAIRMAN. Of course if it serves a useful purpose it ought to be done, but if it does not serve a useful purpose it ought not to be done.

Mr. HILL. The Secretary is very urgent about that. He agrees with me perfectly that only such illustrations as serve to quicken the apprehension of the reader ought to be inserted.

The CHAIRMAN. In whose hands is the matter of getting those illustrations out?

Mr. HILL. In mine; but the authors appeal from me to the Secretary. Then there is a triumvirate and he is the umpire, and sometimes he says: "Let them have a little bit more. I don't want to check that fellow's enthusiasm. He is doing excellent work. The author approaches me with tears over these five pictures and they will cost $50. I guess I will have to let him have them. He is doing good work."

Representative SCOTT. I would like to ask what the duties of the chief folder are?

Mr. HILL. The chief folder is practically an assistant foreman. The matter handled in that department by the foreman and his assistants involves the receiving, shelving, and putting in the proper bins and then distributing, with the exception of the farmers' bulletins, between 9,000,000 and 10,000,000 documents, and the chief folder is the man who is supposed to keep track of the supplies and to know just where things are. He is the leader in that folding business.

Representative SCOTT. Your division, then, looks after the mailing of these documents?

Mr. HILL. We do not only the mailing of all the publications, but we do the mailing of the majority of all the circulars that are sent out from all the divisions. Wherever a division sends out circulars in great bulk, a great many thousand, they are generally handled by us.

Representative SCOTT. As a matter of fact, very few members of Congress send you addressed franks for the entire quota of documents to which they are entitled?

Mr. HILL. They sent us addressed franks for 4,250,000 last year. They did not send all they were entitled to, but some of them do place a great many of them. They bring me orders from other Congressmen for their quotas, and we have had a single Congressman in that way send us addressed franks for 75,000 bulletins.

The CHAIRMAN. A single Congressman for 75,000?

Mr. HILL. Yes.

Representative SCOTT. The aggregate is only about half the allotment each year, is it not?

Mr. HILL. No, sir; it is very much more than that. The total allotment would have been about 5,000,000.

Representative SCOTT. I thought it was about 8,000,000.

Mr. HILL. No, sir; the total amount of farmers' bulletins printed altogether was only a little over 6,000,000, and the Senators and Representatives are entitled to four-fifths under the law, and they take about three-fourths.

Representative SCOTT. That is doing better than I thought they did.

Mr. HILL. They take a little over two-thirds. They took, to be exact, 4,190,000 out of six million and a quarter printed.

Representative SCOTT. What do you do with the remainder?

Mr. HILL. Those are the Secretary's quoto, and we never have enough.

The CHAIRMAN. Some of them are given to Congressmen who ask for additional numbers?

Mr. HILL. Then you see we have 240,000 given to correspondents who are cooperating and working with the Department, who all write to us direct for what they want, and we can not very well refuse. It is the only courtesy we show them.

The CHAIRMAN. Doubtless some of these documents are more popular than others?

Mr. HILL. Yes.

The CHAIRMAN. What do you do with a document that is not called for?

Mr. HILL. I print them now in such small numbers that they are generally used up, and I reprint them whenever the call is increased. Of course sometimes we overestimate. In his enthusiasm an author will sometimes think there is going to be a greater call than there is.

The CHAIRMAN. You say you reprint. You mean at the Government Printing Office?

Mr. HILL. At the Government Printing Office. We keep the plates twelve months, and we generally print a small edition and test the demand. We have reprinted in some cases twenty times.

The CHAIRMAN. For instance?

Mr. HILL. Take the potato-disease bulletins. We printed over 400,000 copies in editions of 20,000.

The CHAIRMAN. On the diseases of the potato?

Mr. Hill. Yes, sir.

Representative SCOTT. In the course of years there must have accumulated a vast bulk of uncalled-for documents. What do you do with them?

Mr. HILL. When I went to the Department there were tons of them.

Representative SCOTT. What have you done with them?

Mr. HILL. They were turned over, under the act of January 12, 1895, to an officer called the superintendent of documents, an officer of the Public Printer, and he sorts them out. A great many of them, I presume, have been destroyed. When I first went to the Department, before there was any editor, every man made out his own requisitions.

Representative HENRY. You refer to Mr. Ferrell, over in the Union building?

Mr. HILL. Yes. Every man in former times was his own judge of what ought to be printed, and the editions ran from 10,000 for the most modest up to 25,000. Of course, sometimes there would be a tremendous lot of them left over. One of the first things I did when I went there was to bring the editions for the technical publications down to from 3,000 to 2,000 and for the more popular editions to from 10,000 to 5,000, and of the later issues there are very few that we are not obliged to issue reprints of. I remember in the old days cutting a man down on what he thought was going to have a tremendous demand. He wanted 100,000 copies. I cut him down by hard work to 50,000. He went to my superior officer at that time, ten years ago, and got him to say he might have the 100,000, and five years afterwards I had 50,000 of them still on hand.

The CHAIRMAN. What was the bulletin?

Mr. HILL. It was a cotton bulletin.

Representative DAHLE. Is it not also the case that if we should ask for one of your most expensive bulletins your Department would not be apt to grant it to us?

Mr. HILL. The Department would be mighty apt not to have it. I write letters to members of Congress at the rate of twenty a day, and, with hardly a single exception, I have to say that this, that, or the other is exhausted.

Representative DAHLE. That you do not have?

Mr. HILL. Yes; and when they are very expensive we can not afford to reprint them.

Representative DAHLE. I have found that to be the case, and I have tried to select what I supposed to be of the most value to my people. They are not among your smallest ones, by any means, and I find I can not get them.

Mr. HILL. You must remember another thing, Mr. Dahle. The law prohibits the Secretary from printing any more than a thousand copies of a bulletin containing more than 100 pages, and the thousand copies is a mere drop in the bucket.

The CHAIRMAN. The idea was to make them brief and terse?

Mr. HILL. That was the idea.

The CHAIRMAN. It works that way, does it not?

Mr. HILL. Well, it is not a bad idea, though I think they might trust the Secretary and the editor to keep them within limits. It is an awful nuisance to us sometimes to have a valuable document and only be able to issue a thousand copies.

The CHAIRMAN. It can be curtailed to within a hundred pages, then. What is your limit if a document is below a hundred pages?

Mr. HILL. There is no limit.

The CHAIRMAN. That is the idea. It was to curb the tendency to write bulky documents?

Mr. HILL. Yes; it was to meet the view the President expressed.

Representative SCOTT. There is no limit upon the number of editions?

Mr. HILL. Yes; you can not issue an edition more than once a year it is over 100 pages.

The CHAIRMAN. That is, if it is over 100 pages?

Mr. HILL. Yes, sir.

The CHAIRMAN. Here is a good-sized bulletin, and there are only 32 pages in it.

Mr. HILL. We never issue the farmers' bulletins of over 48 pages, and we aim to get them from 20 to 24 pages.

The CHAIRMAN. You do not often get a bulletin of more than 100 pages?

Mr. HILL. When we do, it is almost always owing to the necessity of the case, and in those cases it is very apt to be something called for by Congress, you know.

Representative DAHLE. Of any bulletin published containing over 100 pages, how many, in any instance, do you allow to a member?

Mr. HILL. We do not allow you any. We take it for granted in that case that if Congress wants any more it will order it published specially. We could not spare a single copy on an issue of a thousand, you know.

Representative DAHLE. That is, to us.

Mr. HILL. No; it is hardly enough to meet the absolutely necessary demand of the Department. We put them in our list as exhausted when the list appears first. We can not distribute any. They are all taken up at once.

Representative DAHLE. So that all bulletins that are as good as that are called for directly?

Mr. HILL. Yes; they are disposed of the day they are received.

The CHAIRMAN. What do you mean, Mr. Dahle, by "as good as that?"

Representative DAHLE. I mean as large as that. When you say they are disposed of the day they are received, where do they go?

Mr. HILL. In the first place, every college and station gets one—the libraries of the colleges and stations. That is 127. The superintendent of documents gets 50. We put 100 in reserve, so that we will not be run out entirely.

Representative DAHLE. They are practically for the Secretary?

Mr. HILL. They are practically for the Secretary. Then every division or bureau has a list of special persons to whom all its publications go, and generally that list runs from 400 to 2,000 or 3,000. They have to pick out a certain number of those; in the case of one of these small editions, the most important persons we think ought to receive them. Then we have a list of 280 libraries that get them, and we have a few foreign exchanges that have to get everything because they send us everything. The foreign exchange is a very important matter to us. We get many thousand publications of the most important character from all the scientific agricultural bodies and institutions in Europe and in all parts of the world.

Representative SCOTT. The book on the diseases of the horse is being revised, is it not?

Mr. HILL. It is being revised.

Representative SCOTT. When will it be published?

Mr. HILL. That would be very difficult to say. It depends on how long the revision will take.

The CHAIRMAN. It is in the hands of Dr. Salmon, is it not?

Mr. HILL. Yes; it is in the hands of Dr. Salmon.

Representative HAUGEN. Are there two volumes, one on the diseases of the horse and the other on the diseases of the cow?

The CHAIRMAN. No; it is the diseases of the horse only.

Mr. HILL. Both were ordered to be revised.

Representative HAUGEN. They have not been ordered printed, have they?

Mr. HILL. They have been ordered printed as soon as revised.

Representative HAUGEN. How many copies?

Mr. HILL. Two hundred thousand of the horse book and 50,000 of the cattle book.

Representative WILLIAMS. The diseases of the horse and of what?

Mr. HILL. And of cattle.

The CHAIRMAN. You said this assistant at $2,000 was at the head of the farmers' bulletin?

Mr. HILL. The farmers' bulletins; yes.

The CHAIRMAN. Assistant of what?

Mr. HILL. Editing.

The CHAIRMAN. Assistant editor?

Mr. HILL. Yes.

The CHAIRMAN. On your lump sum roll are there any people that in your judgment ought to be transferred to the statutory roll and made permanent?

Mr. HILL. Well, I suppose they could be. There is one at $1,600 that could be transferred. I would a great deal rather not see him transferred, though, simply for this reason: For instance, supposing he were to go away, I would want to put a $1,400 man in his place and make him begin where the present assistant began. I bring them all in from below. Then if he becomes very valuable and I want an extra $200, it is very hard to get it. I would rather economize on the new man and have a little leeway to reward the men of experience that have been with me for years. They are the most faithful set of workers I have ever had with me anywhere. There is not one of these men that does not put in as much extra time as all his annual leave amounts to, and none of them get their full annual leave.

The CHAIRMAN. Forty-three laborers at $480.

Mr. HILL. We call those people laborers, but they include a number of people who address franks. We addressed three million and a half franks.

The CHAIRMAN. What franks?

Mr. HILL. The franks on publications that go out. They write the franks, you see—miscellaneous distribution.

The CHAIRMAN. I thought the members were required to do that.

Mr. HILL. That is only the farmers' bulletins, and the farmers' bulletins distributed for Congressmen represent only two-fifths of the publications.

Representative DAHLE. What are the others?

Mr. HILL. The others are miscellaneous publications, such as the Yearbook. Here is another of them——

The CHAIRMAN. You mean they go out under the frank of the Department.

Mr. HILL. They go out under the frank of the Department.

The CHAIRMAN. And the members address all their franks?

Mr. HILL. They address their franks for farmers' bulletins.

The CHAIRMAN. For everything, do they not?

Mr. HILL. We had nearly 4,500,000 other publications besides farmers' bulletins, you know.

The CHAIRMAN. Do not the members address all their own franks?

Mr. HILL. No; that is to say, when they write for miscellaneous bulletins they simply ask us to send such and such bulletins to such and such people and leave us to write the franks.

The CHAIRMAN. Is it not provided here that they shall address their franks?

Mr. HILL. Only in the case of the farmers' bulletins. The law in regard to them says that they shall provide addressed franks for this purpose—that is, for the four-fifths which shall be delivered to them or sent out under their addressed franks.

The CHAIRMAN. Senators and Representatives?

Mr. HILL. That refers only to the farmers' bulletins.

Representative SCOTT. You have a long permanent list of people to whom you send these publications. I presume you have that list on a mailer, so that you can print the addresses?

Mr. HILL. Yes; we use mailing machines. For instance, for anything like a permanent list we have a rubber list, and the Office of Experiment Stations has a list of some fourteen hundred that is all printed. We use the Dick mailer, and in some of the statistical lists and others that are fairly permanent we have them in some printed form; but in addition to all that you must remember that we get calls from the country at large. I figured up one year—I have never done it since, because it did not seem worth while—but two years ago I figured up the number of applications we got from outside for publications, and they averaged a thousand a day for every working day of the year, and each one covered from one to two dozen publications. All these have to be attended to. Every order we send involves the writing of the name at least three times. We have got to have it on the order, we have to have it on the frank, and we have to have it on the notification card. We send out notifications to everybody that we send things to. Then we registered 31,000 packages of publications last year, and in all the cases of these important publications you speak of, such as the Report of the Bureau of Soil Survey, the Annual Report of the Office of Experiment Stations, the Yearbook, for all of these we keep a card index.

The law says precautions shall be taken by the officer in charge to prevent duplication, and I may say it does prevent duplication very much, because, owing to that card index, we arrest the duplication of from 5,000 to 10,000 publications every year. We only do it, of course, for the more expensive ones. It would be cheaper, of course, to lose one of these smaller publications than to keep a card index for that, because this is work that requires intelligence and better-paid people. In the main, those laborers are very hard-working people. We can not, under the law, give them more than $60 a month. The majority of them get about $480 and $600 a year.

The CHAIRMAN. What are they mostly—women?

Mr. HILL. A great majority are women.

The CHAIRMAN. Are they appointed now under civil service?

Mr. HILL. Now all new appointments must come under the classified service; yes. Those that were in are left in a sort of Mahomet's coffin condition, neither on earth nor in heaven; but we can not appoint any new ones since July 1.

The CHAIRMAN. Now, Mr. Hill, I see you ask for an increase of $10,000, which is entirely to be used for labor and material.

Mr. HILL. Material and labor in distribution.

The CHAIRMAN. Why that increase? What is the necessity for it?

Mr. HILL. I am judging simply in this way——

The CHAIRMAN. You are not going to publish any more than you did last year, practically?

Mr. HILL. Well, we will.

The CHAIRMAN. You have $107,000 for farmers' bulletins.

Mr. HILL. But I have an increase of $20,000 in the general printing fund, which does not appear in this appropriation. The general printing fund makes an appropriation for the use of the Department of Agriculture, which is a fund under my control and amounts to $175,000.

The CHAIRMAN. Does not that take care of itself in the way of labor?

Mr. HILL. Oh, no; it does nothing but provide the printing and turning over of the publications to us——

The CHAIRMAN. Actual printing, you mean?

Mr. HILL. Actual printing.

The CHAIRMAN. No preparation or anything?

Mr. HILL. Nothing but mechanical work of printing and binding. That is all that does, and that has increased since I have been here from $30,000 to $175,000.

The CHAIRMAN. There is still an item for a horse and wagon. You have bought them, have you not?

Mr. HILL. We bought them.

The CHAIRMAN. Then you will not have to have that?

Mr. HILL. There is the maintenance of a horse and wagon; but still one of the horses might die, and it would be awkward to replace him without authority to purchase. The necessity of the horse and wagon was largely brought about by the farmers' bulletins, because we have to do such a large delivery. You see we mail them for the Congressmen or else we deliver them. We either bring them up here or deliver them to the members' houses, or else we mail them for them.

The CHAIRMAN. You said a while ago that you had a chance at times to detail some of these people to other bureaus.

Mr. HILL. Yes. Occasionally there will be a lull in my work.

Mr. CHAIRMAN. There are six or seven detailed now?

Mr. HILL. Yes. I have had as many as eighteen or twenty detailed for a short time. The same difficulty occurs, I presume, in other bureaus as occurs with myself. My experience has been that every year's appropriation which I make up in September for the twelve months beginning the 1st of July has been the hardest kind of work to get through with. I have hardly made enough provision, you see. I can not control the work in my Bureau. I can not say, "Well, we will not undertake this this year, and we will not do that very much." I am like the boy in the haymow—the work is thrown on me and I have got to dispose of it or be smothered. Every increase of work which you gentlemen give to the departments, every additional division or every additional line of work assigned to a bureau or division, involves the publication of more or less reports and the issue of more or less circulars, and all that devolves on my division.

The CHAIRMAN. How did you get along on last year's appropriation?

Mr. HILL. You gave me a defficiency. This year, I trust, you will not have to do so.

The CHAIRMAN. I mean this current year. I do not mean last year. How are you getting along?

Mr. HILL. This current year I am having awful hard work. I am as hard up as I can be, but I am struggling very hard in the hope that I will not have to bother you again. I hope not.

The CHAIRMAN. There was a distinct cause for that deficiency last year. There was a little oversight in the bill.

Mr. HILL. Yes; it enlarged the money for the farmers' bulletins, but did not enlarge it for labor and material.

The CHAIRMAN. We did not distribute your appropriation in proper proportion.

Mr. HILL. No; but there is a steady increase. It seemed to me it was very modest to put it at $10,000 increase for the twelve months beginning the 1st of next July.

The CHAIRMAN. I have heard no expression on the part of Congressmen wishing for more farmers' bulletins.

Mr. HILL. No, sir.

The CHAIRMAN. The quota now is sufficient?

Mr. HILL. I would not estimate it now for any more because they did not draw the full quota to which they were entitled. Many of them drew more, however.

The CHAIRMAN. But as a whole they were not drawn out?

Mr. HILL. They were not drawn out.

The CHAIRMAN. How many of them are remaining?

Mr. HILL. Half a million.

Representative HENRY. I only drew out about two-thirds of mine.

The CHAIRMAN. Not more than half a million?

Mr. HILL. No, sir.

The CHAIRMAN. How many quotas is that?

Mr. HILL. It is about thirty quotas. We just turned that in, you know, to meet any possible increase this year. It may be more; it may be less. One year—I do not know what happened to the members—they sent for less than half their quota; but that is the only year it ever happened. In all other years they sent for about two-thirds to three-quarters of their quota, of the total quotas. Then, you see, I have to hold onto them because I never know when I am going to get orders. Some Congressmen will secure transfers from city members, so that where I think I am away ahead I will suddenly get calls for 150,000 bulletins from ten Congressmen from cities; but they have been solicited by their colleagues, and they give them their orders—"Transfer my quota to so and so."

The CHAIRMAN. Have you any suggestions to make to the committee based on your experience in the management of this office?

Mr. HILL. No; I think not. I do not see anything that we can do more than we have been doing in the last few years. As I tell you, the orders now given to me by the Secretary are very peremptory on this matter of illustrations, which I think is our only extravagance. I will admit that to a certain extent we are extravagant in that matter.

The CHAIRMAN. That is a pardonable extravagance, from my standpoint. I do not advocate an indefinite extension, you understand.

Mr. HILL. No; I understand. If we had room, Mr. Chairman, I think I would have several suggestions to make. I think we ought to write even fewer than we do of the addresses. We ought to resort to mechanical methods, but we have no room to keep our lists. My division is divided between four different buildings.

The CHAIRMAN. How much does it cost, in your opinion, to address the franks? I do not think that was ever contemplated, that the Department should address the franks of members. It is almost as much work for them to furnish that list of addresses, written out, and the post-office, as it is for them to address the franks. I do not see why they should perform the labor and then have it done again practically by the Bureau of Printing.

Representative HAUGEN. Mr. Chairman, when a letter comes to me asking for five or six bulletins, I generally refer it to Mr. Hill and ask him to be kind enough to send them.

Mr. HILL. They come to me in the form of letters very often.

The CHAIRMAN. That is a small proportion of the whole, is it not?

Mr. HILL. As I say, I do not suppose of that three million and a half franks we wrote there were 100,000 or 125,000 for Senators and Representatives.

The CHAIRMAN. The rest were Department franks?

Mr. HILL. The rest were Department franks and demands coming to us from every part of the country.

The CHAIRMAN. Then that is a small matter.

Mr. HILL. Yes; outside of the farmers' bulletins it is a small matter. The only difficulty is this: They occasionally address them on seed franks and we have to rewrite them. We really ought to send them back.

The CHAIRMAN. You ought to send them back.

Mr. HILL. I do sometimes, when there are a great many.

The CHAIRMAN. That is not the Congressman's fault. His secretary has overlooked the thing; and if it is called to his attention once, he probably will not do it again.

Mr. HILL. I sometimes send them back, but they beg off and say: "I am just going away, and I wish you would rewrite them, if you need them. What difference does it make to you what franks are on them?" It is the post office, you know.

The CHAIRMAN. How often does that occur?

Mr. HILL. That occurs very frequently. They send publication franks to the seed division, and they send seed franks to the publication division.

The CHAIRMAN. That is a mistake of the secretary, generally.

Mr. HILL. It is very tiresome.

The CHAIRMAN. And it ought to be called to the Congressman's attention.

Mr. HILL. Another thing: In delivering them to us they will deliver us franks intended for seeds because they are on publication franks, and send franks intended for us to the seed division because written on document franks, and we have to keep swapping.

Representative HAUGEN. The seed franks were never furnished until last year, were they, to members?

Mr. HILL. Oh, yes; we have always furnished the seed franks. Publication franks were never furnished—you get them direct from the Public Printer—but for some reason the seed franks are always furnished. If we could get our work into more systematic shape, I would have some suggestions, but I can not systematize as long as I am in four different buildings; and even in the main building I have part of my force on the fourth floor and part of my force on the first floor. There is no doubt that there is some extravagance in that way of doing it. I have to have a great many more messengers. There is a perpetual going and coming between the different buildings in which my division is divided. I have a building over on B street that I pay rent for.

The CHAIRMAN. I see you have.

Mr. HILL. Then I have that old museum building, which will burn up on us some day.

The CHAIRMAN. The bill will be reported for a new building this year. Of course it will take some years to build, but we will make a commencement on it. It ought to have been done ten years ago.

Mr. HILL. In asking for a little more money, my experience shows that in every year there is some increase on the work of the previous year. We have never gone back; we have always gone forward, and the development of the Department involves inevitably a growth in my division. My work is a reflection of the activity of other bureaus and divisions. You see, we grow a great deal in twelve months. I made this estimate last September, and if I had to make it now I would ask for $20,000 instead of $10,000.

Representative COONEY. Mr. Hill, there is one question I would like to ask you in regard to these bulletins and publications of that character: What necessity in the country demands the continual new printing and distribution of these bulletins, over and over again?

Mr. HILL. Simply to meet demand; to meet increase in demand.

Representative COONEY. Is there such a demand?

Mr. HILL. We never reprint except when we get exhausted. For instance, if I issue a bulletin of 20,000 copies and it runs down to a thousand, and the demand is still coming in as actively as ever, I print 10,000 or 15,000 more.

Representative COONEY. There is an appropriation here every year in this bill.

Mr. HILL. They are different bulletins every year.

Representative COONEY. There are two or three, maybe, every year different.

Mr. HILL. Of farmers' bulletins?

Representative COONEY. Yes.

Mr. HILL. We issue an average of twenty to twenty-five every year.

Representative COONEY. And then you go clear back to No. 1.

Mr. HILL. No, sir; we go back now to No. 20. For instance, you take a subject like insecticides. Until we got a new bulletin on the same subject brought up to date we continue to reprint the other on demand as requested.

Representative COONEY. Every year?

Mr. HILL. Sometimes twice or more a year. With potato diseases it was the same way.

Representative COONEY. What I would like to know is, whether in your opinion the demand is general in the country to require this repeated publication every year, or does it simply come from certain classes of members in Congress from certain districts?

Mr. HILL. The closest and most important knowledge we have, as far as farmers' bulletins are concerned, is the demands of members of Congress.

Representative COONEY. Is that demand founded simply upon the necessities of the people or upon the necessities of the Congressman?

The CHAIRMAN. It is founded a good deal on the closeness of the district.

Mr. HILL. No doubt it is affected by the closeness of the district.

Representative COONEY. That is just exactly what I would like to know.

Mr. HILL. At the same time I think the demand outside of that from the country at large will be found to go pretty well in a parallel line with the demands of the Congressman.

Representative COONEY. I wish to suggest my experience. I live in a practically agricultural district. The biggest manufacturing industry is about a blacksmith shop. They are all intelligent people and every county in the district supports one or more colleges. They are an educated people, and I believe that during the six years I have been in Congress 25 would cover the number of personal applications I have had each year for these farmers' bulletins. That seems remarkable.

Mr. HILL. I should say so, judging from what other Representatives tell me.

Representative COONEY. I do not say 25 bulletins, but I will confine it to 25 persons annually. There are some that require a good many bulletins. That is the condition in my district.

The CHAIRMAN. Mr. Gibson tells me that I sent out 25,000 bulletins year before last and I had two acknowledgments. We do not have a personal request for one once in two weeks.

Mr. HILL. We have a very great many demands directly to the Department, but I think a very large number of those come from the nearly quarter of a million people who through the several bureaus and divisions are, you might say, cooperating, active correspondents of the Department.

Representative SCOTT. You do not mean a quarter of a million, do you?

Mr. HILL. I mean a quarter of a million—240,000. There are five million and three-quarters of farmers in the United States, and we are only reaching about a third of them now. I doubt whether we are reaching a third of them.

Representative SCOTT. I was surprised to hear you say that a quarter of a million people were cooperating with the various bureaus and divisions of this Department.

Mr. HILL. You must remember the Statistical Bureau has over 180,000, I think, of correspondents that it employs altogether, forwarding its circulars to them and securing information. Then there is a list of county correspondents and township correspondents. Some of the divisions have a permanent list of these people that will number 1,500, 1,600, or 2,000. Others have permanent lists down to 400, 500, or 600. We do not send all our publications to any individual. When a man writes and says he wants all the publications of a department sent to him, we tell him we will send monthly a little circular showing the publications and their titles, published during the previous month, from which he is expected to order what he wants for his use. There used to be a great waste when we had a permanent list. Of course we could not send a man every one of the 757 publications. It would be absurd; so we send him this monthly list, and the number of persons receiving it is now a little over 90,000. These people write to us constantly. They send us back the lists usually, checking off the two or three or four publications they wish to receive, and that makes a good many. We had, as I say, two or three years ago, 300,000 communications directly to the Department, but that included also such ones as Mr. Haugen spoke of, where a member of Congress would send us a letter, because we counted all those. We had to answer that letter, and we had to answer the Congressman, telling him it would be attended to.

Representative HAUGEN. The answering of a letter of that sort from a member means considerable expense and time.

The CHAIRMAN. It means two letters—one to the member and another to the man he designates. So you can see how correspondence multiplies.

Representative DAHLE. I noticed that we receive notice of publications to which there is attached a certain price. When you speak of the large amount that are sold, is that such as are sold at a certain price?

Mr. HILL. They are sold; that is, they are for sale.

The CHAIRMAN. What is the amount of those sales for a year?

Mr. HILL. They will reach four, five, or six thousand dollars a year.

The CHAIRMAN. What is that turned into?

Mr. HILL. It is turned into the Treasury. It ought to be turned in to the credit of the Department, I think. I have often wanted to get an amendment to the printing bill to that effect. The superintendent of documents sold last year, of our publications, over 25,000 copies, and he tells me he could have sold 75,000 copies if we had supplied them, but they were exhausted. He keeps calling upon us for publications that are exhausted and we can not supply them.

Representative HAUGEN. They are sold at cost, are they?

Mr. HILL. They are sold at the cost of the printing and binding, with 10 per cent added for handling; nothing for the composition.

The CHAIRMAN. What does the paper cost, 5 cents?

Mr. HILL. They will perhaps average 15 or 12 cents. The farmers' bulletins cost me 1½ cents apiece.

Representative HAUGEN. How many pages?

Mr. HILL. They will average 24 pages; but the other bulletins will cost a little more than that. Of the Experiment Station Records, the superintendent of documents takes 300 a month for regular subscribers at $1 a year, and that could be very greatly enlarged if it was encouraged. I hope to see the time when we will charge for everything, a small sum.

Representative SCOTT. Do you publish a uniform edition of the farmers' bulletin?

Mr. HILL. Yes, sir.

Representative SCOTT. How many?

Mr. HILL. Do you mean the number?

Representative SCOTT. Yes.

Mr. HILL. Twenty thousand to 30,000.

Representative DAHLE. When you speak of their costing a little over a cent apiece——

Mr. HILL. A cent and a half apiece.

Representative DAHLE. Did you mean for the four and a half million copies?

Mr. HILL. I mean that each copy costs a cent and a half. We issued 6,250,000.

Representative DAHLE. That is of farmers' bulletins; and of other bulletins you spoke of, about 4,500,000?

Mr. HILL. Yes.

Representative DAHLE. And they cost you the same?

Mr. HILL. No. For instance, 500,000 of those are the Yearbook.

Representative DAHLE. How much does that bulletin cost [indicating]?

Mr. HILL. That bulletin will cost about 6 or 7 cents.

Representative DAHLE. To the Government?

Mr. HILL. Yes.

Representative HAUGEN. How much does it cost for each volume of the Yearbook published?

Mr. HILL. For 500,000, that would be about 60 cents a volume.

Representative HAUGEN. Are they listed at 50 cents or a dollar?

Mr. HILL. He lists them anywhere from 60 to 70 cents on his list.

Representative SCOTT. When a member of Congress sends in the address slips to the number of his entire quota, how do you fill them?

Mr. HILL. We fill them just as he directs. Sometimes he will say, "Fill these with the following ten bulletins." If he gives no further directions than that, we give him 1,500 of each, and sometimes he tells us to put in two in each envelope, especially if he is very flush. If he has two or three quotas from city members to his credit, he will write and send 15,000 franks and tell us to put in two of each.

Representative WILLIAMS. I thought a member could not get over a thousand of any particular bulletin?

Mr. HILL. We ask them to please not order over a thousand, but a member can get pretty much anything he wants.

Representative WILLIAMS. I was under the impression they could not have over that number.

Mr. HILL. We asked them not to do so, because it exhausts us so rapidly of any particular one; but once in a while if a member asks particularly to have his quota made up of twelve or thirteen—as a general rule they do not take over 500 to 1,000 of any one, though sometimes we have had a member ask if he could have the entire quota made up of one bulletin, and we have told him that if he would wait until we have it reprinted he could. We have reprinted 10,000 to 15,000 copies of a single bulletin for a member of Congress, but out of our regular supply it troubles us a good deal to have him call for more than a thousand, because three or four orders will exhaust our supply and we will be without any.

Representative SCOTT. I wrote a letter last year to the division in which I asked that one copy each of the following numbered bulletins be sent to each of the within addresses. In course of time I got back an acknowledgment saying that one of each of the bulletins that I numbered had been sent to each of the addresses. Some of them, I think, had two. That was purely a matter of stupidity, I presume, on the part of the clerk who had filled the order.

Mr. HILL. He misread your letter, without a doubt. There was no reason for that. That was simply a blunder, as you say, on the part of the clerk who was filling the order. They are cheap help, I am sorry to say. We have very few highly paid clerks.

Representative HAUGEN. Most of those people get only $30 to $40 a month.

Mr. HILL. They get $40 to $60. They are not expensive help and they are very, very busy. They have a great deal to do.

The CHAIRMAN. If there are no further questions to be asked Mr. Hill, we will take a recess until 2 o'clock, and we will hear Dr. True at that time.

The committee (at 11.50 o'clock a. m.) took a recess until 2 o'clock p. m.

AFTER RECESS.

The subcommittee reassembled at the expiration of the recess, Hon. J. W. Wadsworth in the chair.

STATEMENT OF DR. A. C. TRUE, DIRECTOR OF OFFICE OF EXPERIMENT STATIONS, DEPARTMENT OF AGRICULTURE.

The CHAIRMAN. Gentlemen, Dr. True, of the Office of Experiment Stations of the Department, is here.

Doctor, as a starter-in your item you ask for $40,000 instead of $37,000. You may go on and state in your own way the general needs of it and the character of work you have been doing.

Dr. TRUE. The Office of Experiment Stations is, as you very likely all know, essentially a clearing house for the whole experiment station movement, and it has relations not only with the experiment stations in this country but with those abroad, so that it forms a center through which comes information that is published by experiment stations and kindred organizations all over the world. That means that we deal in one way or another with about 800 different institutions. One thing we have been trying to do of late, and which has increased our business, has been to get into closer touch with the foreign experiment stations in order that we might gather the fruits of their work for the benefit of the men who are carrying on similar work in this country, and in order to keep that work up as we think it ought to be kept up we need a little more money.

There are now experiment stations in about fifty different countries, and every year they are increased in number as foreign governments are finding out the value of such institutions, and with the increase of these institutions our business naturally increases. One item of that has grown out of the new relations of the United States with tropical regions. A good many of the foreign stations are located in the colonies of Great Britain, France, Germany, and other countries in tropical regions. We have not done much in those regions as yet, but different branches of the Department are taking that work up, and there is great desire on their part to get the information that these foreign stations possess, and so we have been going into that more largely, and that makes an increase of business.

Another thing is that the Department is getting into much closer touch with the agricultural colleges and the whole system of agricultural education in this country. Unless you gentlemen have looked into that carefully of late you can hardly realize how great the activity is in almost every portion of the country with reference to education along agricultural lines; and that is intimately bound up with the investigations of the experiment stations, because those investigations provide the basis on which rest our text-books and our teaching generally in our agricultural colleges, in our agricultural county high schools, in the college extension work, and in nature study work (which is done in such a splendid way in New York under a State appropriation, and also in a number of other States), even in the elementary schools generally through the country there is a desire on the part of a great many teachers to have definite information about the work of our experiment stations in order to teach the children something about agricultural matters.

There is a great ferment of that sort going on and the Department, through the Office of Experiment Stations, is trying to help in that work, to guide it in right channels, and to give assistance where we can. That has increased the work of the Office of Experiment Stations.

Then, again, the new organization of the Department into a limited number of bureaus has thrown back on the bureaus and offices certain general expenses which hitherto have been provided for out of the contingent fund. Take the matter of supplies and stationery, and to a considerable extent the furniture that may be needed. That is a small item in my office, but general miscellaneous expenses of that sort, which hitherto we simply had to draw requisitions for on the contingent fund, we now have to pay out of the appropriation for the Office of Experiment Stations. The things which I have mentioned together make a considerable increase in the business of the office, and so I have asked to have the appropriation raised $3,000. We are working now on $37,000, and we really need $40,000 to do our work in a satisfactory manner.

Then, going a little farther down in the bill, unless there are some questions on this point——

The CHAIRMAN. Go right along, Doctor. Questions will suggest themselves to members probably.

Dr. TRUE. A little farther down we are asking for $15,000 for the Hawaii experiment station, and still farther on $15,000 for the Porto Rico experiment station.

Representative HENRY. What did you have last year?

Dr. TRUE. Twelve thousand dollars for each. Last year, as I understood it, the amount was fixed at $12,000 on the ground that those stations were not well established; that they were just beginning, and so we are in different shape this year in reference to this matter.

The CHAIRMAN. It was also on the ground, Doctor, that the territory to be covered was infinitesimal compared with some of the experiment stations of the country. For instance, Porto Rico is about as big as three counties in my district. Hawaii is even smaller yet. It hardly seems fair, though you might, of course, cite some State, like Rhode Island, to which we give $15,000, to start them in with $15,000. I think $12,000 is very large myself. They are helping themselves also.

Dr. TRUE. There is another side to that. Take Porto Rico, for instance. There you have a territory——

The CHAIRMAN. Fifty by 100 miles.

Dr. TRUE. It is three-fourths as large as the State of Connecticut quite, but you have a population of about a million people, almost wholly dependent upon agriculture, and that agriculture has been carried on in a very rude way, so that comparatively little has been made of it. The question of feeding those people and of raising their standard of living to a proper American level is a very important one, and they recognize the fact that the experiment station may be an important element in their progress, and they have contributed of their means very liberally to that end.

Representative HENRY. Will you tell us what they have done themselves?

Dr. TRUE. They have given us from the insular government $15,000 for the purchase of land and buildings, and the city of Mayaguez, where the station is located, has given us $4,000.

The CHAIRMAN. That is clear at the western end of the island, is it not?

Dr. TRUE. Yes; it is at the western end, but that city was selected after careful examination into the matter both by the insular government and the Department of Agriculture. We sent a special agent down there. The different locations were all looked over, and it was decided that that was the best place, on the whole, to make the headquarters for the station.

The CHAIRMAN. Was there not a point near the center of the island, like Coamo, that would have been better? I do not mean the center of the island, but the center of the coast, for instance.

Dr. TRUE. Of course Porto Rico has really a rim of agricultural land with mountains and narrow valleys in the interior. It would be difficult to find a suitable point for a station that would be in any way central. Mayaguez is a comparatively flourishing community. The city has shown a good deal of interest in the station, as is indicated by the gift of $4,000, in addition to the $15,000 given by the government. Then we have there also the beginnings of experimental work made under the Spanish régime, because there was there a little agronomic station, as they called it, and we shall come into possession of what little property they had, including some small buildings that will be very useful to us. It seems that the people of Porto Rico have done all that could be reasonably asked of them.

Representative SCOTT. Is your experiment station in Porto Rico conducted in connection with other school work?

Dr. TRUE. No, sir; not as yet. It is directly under the supervision of the Department of Agriculture.

Representative SCOTT. How much of a staff do you maintain there?

Dr. TRUE. Now we have four persons—the agent in charge, or director, the botanist and entomologist, an assistant agriculturist (virtually a farm manager), and a stenographer and translator.

Representative SCOTT. What have they done during the past year?

Dr. TRUE. During the past year the station was on a temporary basis, not having a farm. The farm came into its possession just at the close of the fiscal year. Therefore all we could do there last year was to make certain simple experiments in a temporary way. Those were made on leased land in the vicinity of San Juan, and they were very useful to us in that they showed us definitely certain things that we could not do. We tried a good many different crops, and certain of them were found to be absolute failures. Then we also found certain difficulties which we had to encounter. One thing is a very troublesome insect, a kind of beetle which they call the "changa," that goes into the ground and destroys the roots of plants. We have worked out already some methods for the repression of this pest, and we are just publishing a bulletin, which will be issued in both English and Spanish, which will describe this insect and suggest different ways in which it may be dealt with. Of course we will continue the investigation and make it more perfect.

Now that we have gone to Mayaguez and got our farm——

Representative HENRY. How large a tract of land have you in connection with it?

Dr. TRUE. We have just about 235 acres.

Representative HENRY. Is it mountain land or is it good average land?

Dr. TRUE. Some is good lowland. There are some hills, but on the whole it is typical of the agricultural lands of the island.

Representative SCOTT. You bought that with the fund we appropriated last year, did you?

Dr. TRUE. No; we bought that with the money given by the insular government and the town of Mayaguez. It cost about $20,000.

The CHAIRMAN. That is at Mayaguez?

Dr. TRUE. Yes, sir.

The CHAIRMAN. How many acres did you say, Doctor?

Dr. TRUE. Two hundred and thirty-five acres.

Representative SCOTT. That is $100 an acre.

Dr. TRUE. It is land that has been worked, and of course it is in good condition. It has some buildings on it that we can use. We propose to go before the Territorial legislature, in session already, and ask them for a further appropriation for buildings. We need an office and laboratory. The buildings that are there now will do for residences for our laborers, and for sheds, and so on.

The CHAIRMAN. Have you been down there, Doctor?

Dr. TRUE. No; I have not been myself. One of my men went down.

The CHAIRMAN. Who went down?

Dr. TRUE. Dr. Evans. Of course I would be glad to have him come and talk to you if you have time to hear him. The idea I worked on is this: That in Porto Rico—and the same thing is true in Hawaii—we have a very important work to do in the development of agriculture along modern lines, and by giving the stations there just what we give the stations in other parts of the United States we are only doing the fair thing, and we are not taking away from those people the opportunity of self-help by any means, because there is no station in the United States that is run with the $15,000 that the Government gives. In most of the States all the buildings, all the land, and a large portion of the equipment have been provided through the State, either directly by appropriation or indirectly through the agricultural colleges, and a good many of the States are giving quite large appropriations from year to year to aid the stations in their investigations. While the United States put into the appropriation to the States for stations $720,000, the States last year added to that $511,000, and they are adding more and more from year to year. I think the people of Hawaii and Porto Rico, according to their possessions, have done as much proportionately to help our work as the people in the other States and Territories, and we need the $15,000 to run good stations, so far as the current expenses are concerned.

Representative SCOTT. Doctor, is it not likely that after three hundred years of experience the people of those islands have just about demonstrated what crops can be profitably grown on their island?

Dr. TRUE. No; I do not think so.

Representative SCOTT. It is a small territory, and would not the $12,000 be more profitably spent, from the standpoint of the welfare of the people, in teaching them how to handle and take care of the crops which they now raise?

Dr. TRUE. As far as that is concerned, I would not be understood that we are confining our work to new things. That is not so. We also work with them on whatever they have there now. I simply referred to one experiment that we made in trying different crops, but that was only a part of our work. Another piece of work which we have already undertaken is to cooperate with one of their large planters of coffee in experiments to improve the culture and varieties of coffee. Then we are going to take up tobacco work, too, to improve the quality of their tobacco. My agent, who was here a few weeks ago, told me he had some seed already from Sumatra and Java of a very valuable kind.

Representative HENRY. You find the tobacco that has been grown there is inferior, do you not?

Dr. TRUE. Yes; it is inferior in quality.

The CHAIRMAN. Is not Professor Whitney doing that same work? He spoke to us about it the other day.

Dr. TRUE. Professor Whitney cooperated with us in making a soil survey of the island. We paid part of the expense and he paid part; he paid the major part. He wants to go down and do some tobacco work, and we were trying to get cooperation with him in that regard, but it turned out according to the Comptroller that the law would not permit him to work in Porto Rico on tobacco investigations.

The CHAIRMAN. I will say frankly that that was done by the committee intentionally. We thought that for a time we would confine him to the United States—continental United States, I think we said, did we not?

Dr. TRUE. Yes; I think you said continental United States. Then the station work is not simply a matter of raising crops. I have already referred to the insect pest, which is very injurious there. It has not been in Porto Rico so very many years. It was imported. I do not remember just how long ago—perhaps thirty or forty years ago—and spread all about the island.

The CHAIRMAN. What does it attack.

Dr. TRUE. It attacks a great many things; nearly all crops.

Representative HENRY. Are you hoping to find a parasite, or do you propose to find some other remedy for it, such as sprinkling?

Dr. TRUE. We have tried spraying. That is good to a certain extent. Yes, we hope to introduce some fungus parasite such as has been tried in other places. Of course we do not know yet how we are coming out.

Representative HENRY. No; of course not.

The CHAIRMAN. That work is in charge of the entomologist of the station?

Dr. TRUE. Yes.

The CHAIRMAN. Who is your entomologist down there?

Dr. **TRUE.** His name is Barrett. He is a man who was educated here in this country in one of our agricultural colleges and went to the Tropics and engaged in scientific work and other work for a number of years. We were fortunate in getting him. He has proved to be a very valuable man.

The **CHAIRMAN.** What salary does he get?

Dr. **TRUE.** He gets at present $1,200, but we can not hold him at that figure. That is a very low salary, not comparable with what is paid the same man in our stations at home. That will have to be raised the 1st of January in some way. Then we want especially next year to develop some horticultural work in Porto Rico. While citrus fruits—oranges, lemons, and things of that sort—will grow wild in the island, there has never been any systematic attempt to grow them. People are going in there now from Florida and other regions where citrus fruits are grown to try to raise them. Others are looking toward doing that; so we have a great many requests for information along that line, and it seems reasonable that something can be done to encourage and put on a paying basis the growing of citrus fruits. Then there are such things as the mango and the guava and the alligator pear and bread fruit.

The **CHAIRMAN.** These things all grow very well, do they not?

Dr. **TRUE.** They all grow, but are not as good as they might be.

The **CHAIRMAN.** That is a question of taste, is it not, Doctor? Those people seem to like them. I would not cross the road for an alligator pear except in a salad. I think the taste is rich.

Representative **HASKINS.** Those fruits all grow wild, do they not?

Dr. **TRUE.** They all grow wild in the sense that they will grow without cultivation. Of course all of them have been introduced.

Representative **HASKINS.** But they have not been cultivated?

Dr. **TRUE.** They have not been cultivated in any thorough way. Mr. Scott has referred to the desirability of educating those people. Of course that will be one function of the station, and we hope to do a good deal of that. One reason we have not done more of it thus far is that we have wanted to learn the conditions more fully, so as not to make any mistake about it; but our agents have already been out around through the island and got acquainted with the people, and we hope soon to have something like farmers' institutes going, and after a time there will undoubtedly be a movement among the people themselves to establish schools of agriculture.

Representative **SCOTT.** Are the agricultural conditions of that island sufficiently homogeneous so that experiments conducted in one place will solve problems arising in all parts of the island?

Dr. **TRUE.** In that respect the island is just about like most of our States and Territories. We have to carry on experiments in different localities when we have opportunities. This coffee work is not being done at Mayaguez. It is being done in the interior.

The **CHAIRMAN.** Mayaguez is not in a coffee belt.

Dr. **TRUE.** No. We work wherever we can get a suitable opportunity to do it.

Representative **SCOTT.** My question was suggested by some knowledge of the topography. As we learned here the other day, the matter of altitudes makes a great deal of difference, and also in an island located as this is I should think the question of ocean currents and winds would introduce questions that would make work done on one part of the island of little value really to the people of another part.

Dr. **TRUE.** Of course that is true as regards certain things.

The CHAIRMAN. Right in that connection, Doctor, I do not see why you want to buy so much land at Mayaguez as 225 acres, particularly when, as you say, you would have to conduct these experiments at different points on the island to meet different conditions.

Dr. TRUE. That amount of land is about what the average farm is at the agricultural colleges in the United States.

The CHAIRMAN. I do not think we have that amount of land at Geneva, have we? How much land have we at Geneva? Do you happen to remember?

Dr. TRUE. No; I do not think you have as much as that at Geneva.

The CHAIRMAN. I think not, but I do not remember exactly how much we have.

Representative HENRY. We have more than that in Connecticut.

Dr. TRUE. Yes; I think you have more than that in Connecticut.

The CHAIRMAN. Have you all good arable land?

Representative HENRY. No; it is the average New England land.

Dr. TRUE. One thing we want to do which will call for the use of considerable land is to make experiments in animal industry. That we can not do under our present appropriation at all. We will try, in connection with that, various forage plants and grasses to improve the industry. You know there is a considerable animal industry already in Porto Rico. They supply a good many of the cattle that are shipped to Cuba and other islands.

Representative HENRY. Are there any cattle diseases on the island?

Dr. TRUE. I have not thought about that particularly.

Representative HENRY. Your attention has not been called to it?

Dr. TRUE. It has not been called to that particularly.

The CHAIRMAN. They have a very decent kind of little Jersey cattle there. They seem to fatten better than the Jersey. I do not know where they came from. Their oxen all look like little Jersey oxen; some of them weigh 1,100 or 1,200 pounds. They are great workers. They walk fast and the men drive them along at an extraordinary walk. They drive them with a prod entirely. I saw two or three herds there, and they seemed to have some beef quality, those that I saw.

Dr. TRUE. Yes; they make fairly good beef, so that there is considerable interest in that and we are now having experiments made.

The CHAIRMAN. You can not take anything in this country down there. It would die, I suppose, would it not?

Dr. TRUE. Cattle would need to be immunized against Texas fever and other diseases.

Representative HENRY. Jerseys have been taken to Central America.

The CHAIRMAN. These look very much like Jerseys. They are a little heavier bone than the average Jersey.

Dr. TRUE. Those were brought in there originally, but the breed is not the Jersey.

The CHAIRMAN. Yes; and they have become acclimated. You can not take a short-horned bull from here to Texas and make anything of him the first year.

Dr. TRUE. We have had no opportunity, so far as the station is concerned, to look into that side of the work, but that is one thing we would like to take up. It really sums up in this: There is a large field and plenty of work to be done. Thus far we have had $12,000 with which to do it. The people have shown their appreciation of our work by giving us about $19,000 to help in the purchase of land and buildings.

The CHAIRMAN. They practically bought the land, did they not?

Dr. **True**. They practically bought the land. All we ask is that Porto Rico and Hawaii shall receive the same treatment, as far as the experiment station is concerned, that the other parts of the United States are receiving, and when that is done we do not propose to go further, as far as the national appropriations are concerned, but to seek aid from the people themselves.

Representative **Henry**. How about Alaska, Doctor? Are you satisfied with Alaska?

The **Chairman**. Let us finish with Porto Rico, Mr. Henry, before we take up Alaska. I want to ask a question or two before we leave this subject. Go on, Doctor.

Dr. **True**. That is all I care to say about that.

The **Chairman**. Do you think it is going to take as much to make the necessary experiments to develop agriculture in the small island of Porto Rico as it is in one of our States? Do you not think size has really a good deal to do with it—the area to be covered? In that small area you probably have not the same varieties of soils or the same varieties of conditions that you would have in one of our ordinary States.

Dr. **True**. When you come to variety of conditions, we have a wider range in both Porto Rico and in Hawaii than in any single State.

The **Chairman**. How big is Hawaii as compared with Porto Rico?

Representative **Henry**. It is larger in the aggregate.

The **Chairman**. You mean the whole bunch of islands?

Dr. **True**. The whole bunch of islands is larger.

The **Chairman**. How big is the island of Hawaii?

Representative **Henry**. It is larger than Porto Rico, I think.

Representative **Scott**. The aggregate size of the island of Hawaii is about two-thirds the size of Kansas, as I remember.

Dr. **True**. One thing we have to contend with more especially in Hawaii is the local character of the agriculture. The rainfall in Hawaii ranges all the way from a few inches a year up to something like 19 feet.

Representative **Scott**. You mean there are some parts of the islands or some parts of the group that have year in and year out an average rainfall of about 19 feet?

Dr. **True**. That is what our records show. On the windward side of Hawaii there is said to be a rainfall of 300 inches.

Representative **Scott**. Is that far in the interior?

Dr. **True**. That is along the mountains, near the sea.

Representative **Lamb**. Nineteen feet of water?

Dr. **True**. Yes, 19 feet.

Representative **Lamb**. They will soon be destroyed.

Dr. **True**. As far as differences of conditions are concerned, there is great range of work called for.

I would also insist on this, that when you think of the stations of the United States, especially in the larger States, to which $15,000 is given by the National Government, you should remember that this is only a small portion of the money they actually use in some cases already and what they actually need in every case.

Representative **Lamb**. You mean that is supplemented by the State?

Dr. **True**. I mean it is often supplemented by the State. Take the State of New York. That State spends for experiment stations at least $100,000 a year. Fifteen thousand dollars would not go very far in your experiment station work in New York.

The **Chairman**. It was not intended that the United States Government should do it all.

Representative SCOTT. That does not include Government instruction?

Dr. TRUE. No, sir; this is outside of instruction. The State of Connecticut would not be contented to get along with $15,000 a year.

Representative HENRY. Oh, no; we make annual appropriations.

The CHAIRMAN. In the same way the insular government will make annual appropriations, will it not?

Dr. TRUE. It will make annual appropriations for the buildings, but we think that for running expenses $15,000 is just as much needed, and there is just as good a reason for giving $15,000 to the island stations as there is to the stations of the various States. I don't see the difference myself.

Representative COONEY. How many experiment stations are there in the United States?

Dr. TRUE. In the United States at present there are 55 stations.

Representative COONEY. Scattered around in different States?

Dr. TRUE. Every State and Territory has at least one. Some have two, and one has three.

Representative COONEY. What do these stations consist of generally—a farm owned by the Government?

Dr. TRUE. No, sir; the farm is owned by the State.

Representative COONEY. That is usual, is it?

Dr. TRUE. Yes; under the law these stations as a rule are departments of the agricultural colleges. Those colleges have farms; in many instances quite large tracts of land.

Representative HASKINS. Those are purchased by a direct appropriation from the State?

Dr. TRUE. From the State.

Representative LAMB. Who conducts these experiments then?

Dr. TRUE. The experiments are conducted by officers specially appointed for that purpose.

Representative LAMB. By the Government?

Dr. TRUE. No, sir; by the States. These stations are under local control. The Government gives its money to the State, and only comes in to supervise the expenditure. We do not carry on the stations ourselves in the States.

Representative COONEY. The land of this experiment station in Porto Rico belongs to the Department, does it?

Dr. TRUE. No; the land belongs to the people of Porto Rico, just as in the State of Missouri or Kansas the land of the agricultural college belongs to the people. It is on the same basis, except that we manage the station in Porto Rico.

Representative COONEY. You spoke in such a way at first that I thought the Porto Ricans had given that land and had given it to the Department.

Dr. TRUE. No; I did not mean that. I meant that they had contributed to the general enterprise.

Representative COONEY. That is what led me to ask the question.

Dr. TRUE. Yes, sir. I do not like to take up your time, but I would like to say a word to the committee, if there is no objection, on the subject of agricultural education. You are all interested in it.

Representative HENRY. Before you get to it, suppose you tell us a little about Alaska and what you have done there. It all comes right along here.

Dr. TRUE. I did not speak of that because the Secretary has not estimated any larger amount for Alaska than we are already receiving, $15,000.

Representative HENRY. Last year you asked for an extra appropriation?

Dr. TRUE. Yes, sir.

Representative HENRY. You do not ask for it this year?

Dr. TRUE. We are not asking for it.

The CHAIRMAN. What are you doing up there in Alaska?

Dr. TRUE. We have done work in a regular way at three different places—at Sitka; at Kenai, in Cook Inlet, and at Rampart, in the Yukon Valley. We have had cooperation enterprises with the residents there in a small way in a considerable number of places, both in the interior and on the coast. One of the larger of those cooperative enterprises has been at the island of Kadiak. Then we have made an agricultural survey in a limited way in the Copper River region, and if we had the money we would like to carry on some regular operations there. But the experiment-station work in Alaska is peculiar in that in costs more relatively if we carry on investigations in a particular place in a regular way. That is, we can go into a number of places and make small cooperative experiments without very great expense, but when it comes to maintaining a station then the expense runs up fast, because all materials have to be taken there at great expense, and labor is high. So we are practically debarred under our present appropriation from doing more than what we are doing now.

We have been, as I stated to the committee last year, unusually successful, in my judgment, in our Alaska work. The agent that we employ up there is unusually efficient.

Representative HENRY. Professor Georgson?

Dr. TRUE. Professor Georgson. He was here and spoke to the committee last year.

Representative HENRY. Is he in the city this year?

Dr. TRUE. He is not in the city as yet. He may be here later for a brief time. We have, of course, demands in various ways for the extension of our work there, but the Secretary thought that on the whole it was not wise to ask for more than $15,000 this year, in view of the fact that the committee had not as yet given us the same amount of money for the other two stations.

Representative SCOTT. Mr. Georgson has not yet made any report of his operations this season, has he?

Dr. TRUE. Yes, sir; he has made a report on the operations this season.

Representative SCOTT. Is that report in print?

Dr. TRUE. It is not in print. We have just received it. We are getting it ready to print.

Representative HENRY. What have you to say in addition to the last year's report? What have you discovered in addition to the facts established in last year's report?

Dr. TRUE. This year we have made this investigation in the Copper River region, at a place called Copper Center, and there it has been determined, as it has in other places where we have tried, that a number of things can be grown. That is, barley, for instance, will ripen, and vegetables like cabbages and potatoes.

The CHAIRMAN. Right there, Doctor; is it a commercial enterprise to raise barley there—a profitable commercial enterprise? Have you proved that it is or that it is not?

Dr. TRUE. We have not proved that it is a commercial possibility as yet, because we have not carried on the experiments on a large enough scale; but we have gone this far through those experiments—to show that if population goes into these regions and settlements are made, the people will be able to grow such things as they will need for forage for their animals, and in case of necessity, for their own food supply.

I think myself that one of the chief values of our experiments with grain thus far in those regions has been to demonstrate that certain grains will grow, and thereby to show that other things in all probability will do well. That is, where you can have the maturity of barley and oats you can, without much question, grow other crops. Of course we know from other evidence that the grasses will grow and mature there, and so we have the possibility of animal industry. Then a large number of different kinds of vegetables will grow in different parts of Alaska; that is, potatoes, and cabbage, and cauliflower, turnips, etc. I had some very nice large potatoes from there this season which were grown in the Yukon Valley.

The CHAIRMAN. Can you raise them for a profit up there? That is the point.

Dr. TRUE. Yes; potatoes have been raised at a profit in a number of localities, and up at Dawson there is a shop maintained where home-grown vegetables are sold largely. There have been such things as turnips and cabbages raised and sold in quite a number of places even in the Yukon Valley.

Representative HENRY. Last year Professor Georgson stated before this committee that he regarded the agricultural possibilities of Alaska as equal to those of Finland and Norway and Sweden.

Dr. TRUE. Yes; there is no question about that.

Representative HENRY. The further researches have confirmed that opinion, have they?

Dr. TRUE. Yes; they strengthen and confirm it. Consider now the matter of animal industry. We have not been able to take that up in any regular way yet. That is a thing we hope to get to as soon as we can; but the more we investigate, the surer we feel that it is possible to have animal industry on quite a considerable scale in Alaska. The people are taking a few animals in there from time to time, and they are successful in maintaining them. There is an abundance of grass, and over in the islands—take the island of Kadiak for instance—sheep and other animals——

The CHAIRMAN. Is that one of the Aleutian group?

Dr. TRUE. It lies to the east of the peninsula. The animals are allowed to run out all the winter without any care. They pass the winter in safety. If they can grow under those conditions, certainly with management and care there will be no difficulty in developing the industry. The people in the State of Washington, who were at first opposed to our investigations, are now coming into sympathy with them because they see that through the work that we are doing there is a possibility of building up some agriculture in Alaska in a regular way and thus developing other industries so that the trade of the Pacific coast will be increased thereby.

Representative HENRY. I have been told, Doctor, and it has been represented through the press, that the people of Seattle, Wash., were impressed with the belief that the Aleutian Islands and the adjacent coast possessed great stock-growing possibilities.

Dr. TRUE. Yes; they do believe that. That has come about as the result of their own investigation. They have sent men up there to look the matter over. It is not simply our story they are believing, and it is remarkable how the work that the Department has done has taken hold of the people all over that Territory. Wherever there are settlers they are getting our seeds and our directions with reference to planting such things as we have already learned about, and it has encouraged them to increase the amount of their growing stuff very largely. It seems to me, considering the amount of money we have put in there, we have had very good success indeed.

Now, there is one thing that you ought to have in mind, of course, about the Alaska work, that there is not back of that any local support in the sense in which you have it in Porto Rico and Hawaii and the other regions of the United States. The Government is doing all that is being done, as far as the money side of it is concerned.

Representative HENRY. Except cooperative work.

Dr. TRUE. Except cooperative work, which the people can do on their own places in a small way. That, I think, is due to the fact that they have no Territorial government in the regular way. I believe if the people had their own government, and especially if the land laws were made right, so that they could take up land there, we would soon have a constituency who would go to their local legislature and get them to do just as they have done in other places; but up to the present time there is no way of carrying on agricultural experiments in Alaska except through the National Government, so we are doing it all.

Representative WILLIAMS. Now the agricultural education question.

Dr. TRUE. I was going to say a word or two about agricultural education.

It is my business to go all over the United States to find out how the experiment stations are spending their money. Those stations are located, as a rule, at the agricultural colleges, and so I see the work of the colleges as well as the stations. What has impressed me most in the last two or three years that I have been going about is the remarkable growth of those institutions in resources, equipment, and number of students. The fact is that students are pouring into our agricultural colleges throughout the country in such numbers that it is difficult to take care of them. When I speak of agricultural colleges, of course, I am using that term in the ordinary sense. Those colleges are teaching a great deal besides agriculture, but from our standpoint what is the most encouraging is that the number of students who are taking agriculture is rapidly increasing. I think it safe to say that within the last five years the number has at least doubled of those persons who are taking regular courses in agricultural subjects. The teaching of agriculture is also being vastly improved. They are getting it into better shape. They are dividing it into specialties, and we are having the creation of regular agricultural faculties.

One result of that and other recent movements has been to lead to a wide demand for agricultural education outside of the colleges, and the thing which in my judgment is of most interest and importance to us now along that line is the establishment of secondary schools of agriculture and the introduction of the teaching of agriculture into the high schools of the country. We already have several agricultural high schools. The most successful is that in Minnesota, in connection with the college of agriculture there. There is one in Nebraska in connection with the University of Nebraska, which is also succeeding, and Wisconsin has now established two county agricultural high schools.

Representative SCOTT. Why do you think it is necessary to establish these secondary schools of agriculture?

Dr. TRUE. For the reason that that brings the teaching of agriculture home to the farmers in a way that enables them to afford to send their children in greater numbers to agricultural schools.

Representative SCOTT. Is there not danger of overloading the high-school courses? Does it not practically require the establishment of a separate school?

Dr. TRUE. No, sir; I do not think so. As far as the high schools generally are concerned, my idea would be to do for agriculture in the rural communities just what is being done for the manual arts in our city communities. Take the city of Washington, for instance, which is not a commercial city in the ordinary sense. Besides three general high schools, we have two manual training high schools, in separate buildings, one for the white people and one for the colored people, and in addition to that a separate business high school. That is true in other large cities and even some of the smaller cities. The children are getting education along the lines of city industries in the high schools. That has all come about in the last ten years. It is a new thing. Our farmers in thousands of instances are sending their children to those city high schools, and they are getting education which turns them away from the farm rather than toward it.

I had a notable instance of that under my own observation this spring in the State of California. I have spoken of it a number of times, because it is such a typical illustration. I went to the city of Fresno, Cal., which, as you know, is in the heart of the great raisin industry, and all about it are magnificent horticultural plantations. There are millions of dollars invested in horticultural and agricultural operations in the immediate vicinity of the city of Fresno, and that has made the city of Fresno. That city has a high school and in that high school at the time of my visit there last spring there were some 600 students. I was invited to go and make a little talk to them. They have a magnificent building and a fine corps of teachers. They are teaching carpentry and other manual arts, various forms of wood carving, and some ironwork, I think. They are teaching business forms of all kinds; but when it comes to agriculture and horticulture there is not a word of teaching. Now, can not the city of Fresno and the surrounding country well afford to put some money into that high school so as to employ at least one teacher of agriculture——

Representative HENRY. It is all agriculture around it?

Dr. TRUE. It is all agriculture around it; yes, sir.

Representative HENRY. No manufacturing comparatively?

Dr. TRUE. Comparatively none. It is an agricultural and horticultural community. There are all sorts of grave problems coming up before that community with the progress of the horticultural industry, just as come before any community as it grows old in such things. It is not a paradise by any means, though it is a magnificent country. What is true of Fresno, I believe, is true of hundreds, if not thousands, of communities in this country.

Representative WILLIAMS. What of agriculture is there practicable to be taught in that way?

Dr. TRUE. Why, we can teach the principles of agriculture, and to a certain extent improved practices in agriculture. That is, we can do for agriculture about what is done for carpentry.

Representative WILLIAMS. Of course you can teach generally practice and principle; but substantially what is there about the science of agriculture that you could teach profitably to children in a high-school grade?

Dr. TRUE. Well, we could teach them about soils, fertilizers, the culture of crops——

Representative WILLIAMS. You mean the chemical composition of soils?

Dr. TRUE. Yes; chemistry is taught in these high schools.

Representative WILLIAMS. But it has not gone to the point of analytical chemistry in any of them, has it?

Dr. TRUE. It is not necessary that the pupils become analysts, but if a person has had an elementary course in chemistry he can be taught the ordinary facts with reference to the chemistry of soils without any difficulty and understand it. There are thousands of our farmers to-day who have not had any special instruction in schools and yet know considerably about the chemistry of their fertilizers, although they have never analyzed the fertilizers.

Representative SCOTT. The United States can not do anything in this direction, can it? It must come wholly from the State.

Dr. TRUE. I am not pleading for appropriations for schools. The United States can encourage the movement in a general way through the Department, and that it is doing already. It is a matter of great interest to agricultural people.

Representative WILLIAMS. The point is this: I can understand, perhaps, that you write some little elementary book upon agriculture dealing with broad principles and general practice. The State of Mississippi, for example, might have it introduced into her high schools; but how in the world is the Federal Government going to do it? What has it to do with it?

Dr. TRUE. We would not do anything with it. It is for the State to do. I am not pleading for money.

Representative WILLIAMS. You are simply telling us what you think?

Dr. TRUE. I am just telling you that this is a matter of immense importance. This is a matter that is being taken up in the different States now, and has come under my observation.

Representative WILLIAMS. You think some of the experiment-station money that is given to the States might be used in that way, do you?

Dr. TRUE. No; I would not have a cent of it used for that. The extension of agricultural education means, all the time, more demand on the experiment stations to do more thorough work. We do not want to divert any funds.

Representative WILLIAMS. Then this is just an academic question so far as this committee and Congress are concerned.

Dr. TRUE. It is a matter of interest; that is all.

The CHAIRMAN. The officials of the experiment stations in the several States should bring it to the attention of the legislatures of the States?

Dr. TRUE. Yes, sir. They are doing it.

The CHAIRMAN. That would be legitimate, would it not?

Representative SCOTT. I should think so.

Dr. TRUE. They are doing it already.

The CHAIRMAN. And the Department could legitimately bring it to the attention of the agricultural experiment stations, and the officials of those stations, who are always in the Capitol in the winter time to see about their appropriations, etc., could very legitimately bring it to the attention of the legislatures of their several States, and it would lie entirely with them.

Dr. TRUE. Certainly. It is a matter for them to deal with, and they are beginning to deal with it.

The CHAIRMAN. That would be the practical way of bringing about this result, which is very desirable.

Dr. TRUE. Yes, sir; but with the extension of this work there is great demand constantly on the experiment stations to furnish the facts which lie at the basis of all this instruction. There is no question about that.

The CHAIRMAN. Doctor, perhaps this is the time to ask this question. The agricultural experiment stations seem to be more willing to act in cooperation with the Department of Agriculture than they have been. Are you expecting much along those lines? You know how the committee has felt in that way for years, that the agricultural stations are not properly performing their duties, or at least a great many of them.

Representative DAHLE. The State institutions?

The CHAIRMAN. Yes; the State institutions. Do they receive suggestions and indications—that is the word used in the law—more willingly than they did?

Dr. TRUE. Oh, there is no difficulty about that.

The CHAIRMAN. Do they act upon them?

Dr. TRUE. Yes, sir; they act upon them very largely. The Department is cooperating with the stations in all the States and Territories.

Representative SCOTT. In your visits of inspection, have you found any considerable number or any number of agricultural colleges where the fund received from the United States is diverted from the statutory purpose and used for general instructional purposes?

Dr. TRUE. Generally speaking, that is not done, but there are occasional instances in which, from our point of view, that has been done to a limited extent.

Representative SCOTT. When you find a case of that nature, do you suggest to the president of the college or the regents that the fund is being diverted?

Dr. TRUE. Yes, sir; and if it is a case plainly defined we go further than that. We refuse to approve the account of that station, and the Treasury has supported us in withholding a portion of the funds.

The CHAIRMAN. That has been done, has it?

Dr. TRUE. Yes; that was done last year in the case of one institution.

The CHAIRMAN. Whereabouts?

Dr. TRUE. Do you insist on knowing?

The CHAIRMAN. Yes, that should be public property. Congress is entitled to know it.

Dr. TRUE. Of course it should be a matter of record. It is in the State of South Dakota. I ought to explain in that connection how it came about, perhaps, in justice to the people involved. It was not an intentional thing on the part of the college authorities. A man was employed at the beginning of the year as a dairy expert. He was to give a part of his time to teaching in the college and a part of his time to experiments, but as it turned out he was not able to give any of his time to experimenting. They claimed that he had done something in a superficial way, but when we came to look into it we were satisfied he had not done enough to justify the payment of any portion of the Hatch fund as his salary as station officer, so we protested, and the college authorities in that case yielded, and the amount was withdrawn. The Treasury withheld it in the next apportionment. We are in communication at present with two institutions in reference to such expenditures, about which we need further explanations. We are doing that all the time.

The CHAIRMAN. I think I voice the sense of the committee when I say I hope you will continue that kind of work.

Dr. TRUE. Yes; we will continue it.

A great many of the men engaged on station work are also engaged in college work. It is a nice matter, when you come down to it, to decide between the duties of a man as a station officer and as a college officer, so a difference of opinion will sometimes arise as to how that division shall be made. That is the case in many of these institutions and that is a thing we are debating with them all the time as we go about. On the whole, I think the stations are getting the better end of the bargain, because you must remember that these colleges are devoting to the station work their libraries, their buildings, to a considerable extent, and in many cases they are giving the services of their experts without any charge to the experiment-station fund, so that, taken in the aggregate, there is no doubt but what the United States gets a return from all the money that it is putting into experiment-station work, but there may be, as I said, individual cases where we do not think that is true, and when we find a case we hold them up.

I do not know that it is necessary for me to go into anything further with regard to this item of the stations. Of course there are other things I have charge of, such as nutritiou investigation and irrigation

The CHAIRMAN. Is there anything more that suggests itself to your own mind, Doctor?

Representative DAHLE. Has the United States one experiment station in Washington and is that the only one the Government has?

Dr. TRUE. We have no experiment station in the District of Columbia under the Hatch Act.

Representative DAHLE. You have none?

Dr. TRUE. We have none.

The CHAIRMAN. You have one by special act that is being created in Virginia, right opposite the city. That is true, is it not?

Dr. TRUE. Yes; but that does not come under my jurisdiction.

Representative DAHLE. Is that the only station that is directly under the control of the Government?

Dr. TRUE. The Federal Government controls the stations in Alaska, Porto Rico, and in Hawaii.

Representative DAHLE. But not in any of the States?

Dr. TRUE. Not in the States; no. The money is given to the States and it is expended by the local boards. We come in and supervise the expenditures after they have spent the money, to see that they have done it right. That is all the authority we have.

Representative DAHLE. So that in Wisconsin, for instance, we get a part, do we?

Dr. TRUE. You get $15,000 a year given to the State of Wisconsin for a station. You add to that a great deal more.

Representative DAHLE. How much does South Dakota, for instance, get?

Dr. TRUE. South Dakota gets $15,000. Every State and Territory in the Union gets $15,000.

Representative DAHLE. And Mississippi?

The CHAIRMAN. Yes; Mississippi gets $15,000.

Representative DAHLE. Every State gets the same, whether large or small?

Dr. TRUE. Yes, sir.

Representative DAHLE. In Wisconsin we have a good experiment station, as you know.

Dr. TRUE. Yes, sir.

Representative DAHLE. I did not know but that we might possibly get more than some States that were paying very little attention to agriculture.

Dr. TRUE. No. You are wise there. You are putting in the extra money yourselves.

Representative DAHLE. We are?

Dr. TRUE. Yes; and getting great return for it, as you know.

Representative WILLIAMS. My State gives $30,000 a year.

Dr. TRUE. The State of Mississippi recently has made the largest appropriations in its history for agricultural college work.

Representative SCOTT. Before you close your remarks, Doctor, I should like to have your views upon the proposed appropriation of $6,000 for farmers' institute work.

The CHAIRMAN. I was coming to that later on. There are some other items that he has charge of that I would like to take up first. We will take them up in order. Nutrition is the next. In the privacy of the committee we call that Mr. Henry's steal.

Dr. TRUE. Mr. Henry, as I know, has been a good friend of that appropriation.

Representative HENRY. Dr. True will defend me, I am sure.

Dr. TRUE. While that investigation had its origin in the State of Connecticut, it is now carried on throughout the Union; not in every State, but in States all the way from Maine to California and from Minnesota to Georgia. The object is to improve the food habits of our people, and we think we are having a good deal of success along that line.

Representative HENRY. Perhaps the chairman could tell you how much it has saved the great State of New York in public institutions. I have estimated that it was as high as $50,000 a year.

Dr. TRUE. There is no doubt about that.

The CHAIRMAN. Just tell us now, Doctor, in you own way, the character of the work done under that appropriation.

Dr. TRUE. The work may be said to be of two general classes. We are making scientific investigations to improve the methods of investigating and to find out the principles of human nutrition. Then we are making the more practical investigations to find out what the people are actually eating in order to suggest to them ways in which they may improve their diet.

As regards the scientific investigations, we have had the highest success. You can ask any competent scientific authority, the president of the National Academy of Sciences, or any other competent scientific authority, whether the investigations along this nutrition line, carried on under the immediate direction of Professor Atwater, have not been unusually successful from a scientific point of view, and I feel sure he will tell you they have been.

Representative HENRY. The people of the State of Connecticut are so well satisfied with Dr. Atwater's work that a dozen years ago they gave him $2,500 a year as a special appropriation to extend and continue this work in addition to the Government appropriations.

Dr. TRUE. Yes, sir.

The CHAIRMAN. They have lately cut it off, have they not?

Dr. TRUE. Oh, no; they have not cut it off. Professor Atwater has ceased to be the director of the Storrs experiment station, but they have turned over to him the direction of the State nutrition fund.

Representative HENRY. He retains that.

Dr. TRUE. As regards the food of people, we have made investigations both in the cities and in the country, and have shown that in many ways our people may improve their diet and may get more for their money. We are going on with that work.

One special thing that we wish to take up, and that is what we are asking the small increase of appropriation for, is this: All over our country are public institutions—insane asylums, prisons, almshouses, etc.—in which large numbers of people are being fed in a regular way. We believe that through investigations of the kind we are making we can show how those people can be better fed at less expense. We have already demonstrated it to our satisfaction in the insane asylum in the State of New York, where the work was taken up for a brief time on State authority. We showed that they could give better food for less money. It is not a simple question. Take insane asylums. It is a question of feeding the people according to their condition, and that is a matter about which there has been comparatively little done, so that we are entering in that respect a comparatively new field.

To test that matter further this year we have made an arrangement with Dr. Richardson, the superintendent of the asylum in the District of Columbia, commonly known as St. Elizabeth's, and he is at work now testing the diet of his patients. An expert is employed there at his expense. We are putting in advice and assistance, and we shall probably publish the report in connection with our other reports. That work, we believe, could be usefully extended in other places. We want to do enough to definitely show its application, not with the expectation that we are going all over the country to make dietary studies in every insane asylum or hospital, but we want to do enough, just as we have done in general, to show the value of this study and to suggest the methods for the work. Then we propose to turn it over to the State authorities or the private organizations to carry it on.

The CHAIRMAN. Will it be a question of doctors disagreeing when you get through?

Dr. TRUE. Of course in a complex matter like human nutrition there will be some disagreement——

The CHAIRMAN. How long has this investigation been going on?

Dr. TRUE. This particular investigation?

The CHAIRMAN. No; I mean how long has the appropriation for nutrition investigation been going on?

Dr. TRUE. Nine years, I think.

The CHAIRMAN. There are some points you must have reached the end of definitely in some of the investigations, have you not?

Dr. TRUE. Certainly. A number of investigations we have closed out.

The CHAIRMAN. You are constantly asking an increase each year to meet some new point that has arisen. Have not some of the points been closed? Is not the expenditure that has been used for those investigations closed?.

Dr. TRUE. Yes. We are changing our work from year to year as far as it seems wise to do so; but at the same time the growth in the interest of the work has caused its extension in a reasonable way. We are only asking for a small increase in that direction.

We are distributing this work so as to reach the important centers of investigation. As far as we are able we are working on the particular questions that relate to cereals in Minnesota, where we are in immediate connection with the large cereal interests of the country. We get our samples and our understanding of the business best there. We are working on the question of meats particularly in the State of Illinois, and there we are going to work now on a cooperative experiment with the Illinois experiment station. They are doing a large amount of work in the feeding of cattle. They have large funds from the State. The State has put in something like $40,000 or $50,000 into special investigation, and a considerable part of that money is going to animal husbandry investigations. They will buy animals by the carload and fatten them on different rations. We will take the meat that is produced in that way and determine it with reference to its fat content and the distribution of the fat; then we will analyze it with reference to its chemical composition; we will also feed certain portions of it, after cooking, to men, and make actual digestive experiments with human subjects, to determine the digestion of meats. We will also make cooking experiments in different ways; and so we will try to cover broadly the nutritive value of meat and its proper place in the diet of man.

That is a new line of work, and it is being done in a new way.

The CHAIRMAN. Do you think that food affects each person in a certain way?

Dr. TRUE. No; it does not, and therefore we want to carry on the experiments on a large enough scale to take out a personal equation. That is one reason why we want more money.

The CHAIRMAN. I see Dr. Wiley is finding one of his boarders getting thin and the other getting fat on precisely the same food.

Representative WILLIAMS. That grows out of mental anxiety, they say, on the part of the fellow that is getting thin.

The CHAIRMAN. I do not know what is the cause of it.

Dr. TRUE. Dr. Wiley is doing along the line of the adulteration of food just what we have been doing for a number of years along the line of the normal food without reference to adulterations. Dr. Wiley's province is the adulteration. We take the ordinary food. Before Dr. Wiley gets through he will find many difficulties growing out of the individuality of his subjects. There is no difference in that respect between experiments with men and experiments with animals.

One thing the experiment stations have learned as a result of their years of experimenting is that they have got to take into account the individuality of the animals they experiment with. For that reason experiments with two or three animals on a small scale, as we used to do it, are not sufficient. As in the case of Illinois, just referred to, we have to take a carload of animals for certain experiments before we can be sure we have demonstrated the actual facts. One thing we have found out, for instance, is that food passes through different men in different ways at different periods of time.

Representative COONEY. Do you think that experiment would establish a conclusive fact, so as to be of benefit to all of us around here before we die?

Dr. TRUE. I think so; yes, sir.

Representative DAHLE. Will the result of your experiments be published?

Dr. TRUE. Certainly.

Representative DAHLE. Are they being published now?

Dr. TRUE. We are doing this as fast as we can prepare them for publication.

Representative DAHLE. Are they being published to the same extent as the farmers' bulletins?

Dr. TRUE. We are putting them into farmers' bulletins and into our technical reports. We must first make our technical detailed reports and get the matter a matter of record.

Representative **Dahle**. Are they being published so that our constituents can write for them and get them at the present time?

Dr. **True**. Certainly; we are sending out farmers' bulletins on that subject all the time, and, what is more than that—and this is a thing of vast importance—we are furnishing, through these investigations very largely, the scientific basis for the teaching regarding foods in schools. That is going on all over the country. They are teaching in reference to these matters on the basis of the information we furnish. Our bulletins are widely used in the schools.

Representative **Dahle**. Judge Cooney asks if I want to learn to do without eating. That is not my idea, but I can imagine that I have constituents who would like to learn how to live economically, because it is very likely now that living on cereals is cheaper than living on meats.

Representative **Williams**. I want to tell you one curious thing about all this. It has demonstrated how nicely God Almighty takes care of humanity without their knowing it. Mr. Atwater went through a great many experiments, and finally came to the conclusion that one of the cheapest and most nutritious foods was fat hog meat and beans. The average plantation nergo just lives on pork and beans; so it demonstrates that God is operating with science.

Dr. **True**. But we also found there were a considerable number of people, both North and South, who were not eating food that was the best for them.

Representative **Williams**. Dr. Atwater came to the conclusion that pork and beans were a pretty full diet and as good as anything else for people.

Dr. **True**. We found out about the Southern diet one interesting thing. A great many people have the idea that the Southern people use a large amount of fat in their cooking and that they eat an excessive amount of fat; but the fact is that they put in the fat to balance their ration. A good deal of their meat otherwise would not be fat enough, and other things they eat would not bring the fat content up enough; so they are not so much out of the way as they might seem to one who was not accustomed to their methods of cooking.

The **Chairman**. It is a fact that all of the tropical people are great consumers of pork, is it not?

Dr. **True**. Yes.

The **Chairman**. They use a great deal of fat pork in Porto Rico and Cuba?

Dr. **True**. Oh, we are not vegetarians. We have taken the whole round of food products.

The **Chairman**. We increased that appropriation last year, did we not?

Dr. **True**. The year before that you increased it a little.

The **Chairman**. And a year before that we increased it a little. We have been going up from $10,000, I think.

Representative **Henry**. We started at $15,000. We put it down the second year by a misapprehension, and put it back.

Dr. **True**. The work is growing naturally. We are not making any effort to force it, but it does grow from year to year, and the interest grows throughout the country.

The **Chairman**. That is one thing we can not understand, Doctor—not only as applied to this, but to all these scientific investigations—that you seem never to end; you never seem to come to a conclusion on one matter and then use that money along a certain other line. If you want to take up a new line, there is always a new appropriation asked for, and that staggers the committee.

Dr. TRUE. That is not so in this case. We are closing up certain investigations every year, but we are also making other investigations and extending the scope of our investigations. The two things are continually going on. For instance, we made some studies of dietaries in farmers' families in Vermont last year and got considerable useful data. We are not going to do that this year. Under the present arrangement there will not be any money spent in the State of Vermont. We are going down in Georgia to see how the people live down there in the country; and so we are changing about all the time.

As regards the growth of investigation. I suppose this is a general matter that comes before the committee all the time with regard to the Department of Agriculture. I do not believe that the investigations of the experiment stations and the Department of Agriculture are growing as fast as the agriculture of the country is growing, or as fast as the interest in the work of those institutions is growing and the demand for the work is growing. If I remember rightly the census of 1890 made the current value of the agricultural products of this country about $3,000,000,000. The census of 1900 makes the aggregate value of farm products $5,000,000,000 as against $3,000,000,000 ten years ago. There are $2,000,000,000 added to the annual value of the agricultural products of this country in ten years.

The CHAIRMAN. About 60 per cent.

Dr. TRUE. Yes, sir; I claim that the work of the Department of Agriculture and experiment stations has been a large factor in that increase. It has not done it all, of course, by any means; but it has been a large factor, and I can point to instances in individual States where the investigations of these institutions have been of more value to those States individually than all the money that has been spent on them. I think that is a valid argument for an increase in the appropriation for this Department from year to year. We can not help the agriculture of this country growing, and we can not help its demands on us growing. Just as soon as we have been successful in any one line of work, there comes a flood of demands to take up work in other lines because of the investment that has come out of it. We can not help that, and it is not a thing we are trying to force in the Department of Agriculture or in the experiment stations

I really think from my observation—and it has been extended all over the country—that we are simply making reasonable requests from year to year for the extension of our work. Of course it rests with the committee to judge how far we are right about that, but if you take the sense of the people generally, the intelligent agricultural people of the country, I believe they are more and more in sympathy with our work, because they appreciate its value more; and I do not see how anybody can ride along on the cars through our States and Territories without constantly seeing through the car windows the results of experiment station work and Department work. There is no question in my mind but that the general methods of farming in this country have been remarkably improved within the last ten years.

Representative DAHLE. I have noticed in Wisconsin that changes have taken place, that farmers have certainly learned how to farm. Some people left our place, say, ten years ago and went to the Dakotas and they did not have luck. We heard of their failure year after year. Now it seems that those same people have learned out there better what kind of farming to carry on and are more successful. May not that be the case in other parts of the country as well? For instance, in the South or in the farther West would you suppose that farming on general principles has improved?

Dr. TRUE. Yes; it is general throughout the country. I do not think there is any question about that.

The CHAIRMAN. They are showing a great improvement. Nobody denies that, Doctor.

Representative DAHLE. In South Dakota years ago they did not know what sort of grass to raise that they could depend on. Now it seems they have found out that alfalfa will do well, where before they did not know of any grass that would stand the droughts that country is subject to, and I presume it may be so in other lines.

Dr. TRUE. Then they have these agricultural institutions that they did not have before. Suppose a man goes into South Dakota to-day to farm. He can appeal to the experiment station at Brookings and find out there reasonably well what kind of farming is likely to succeed in any part of that State. The information they give him will be based on definite knowledge and impartial knowledge. It will not be like what he got fifteen years ago from land agents and people who had farmed in one little district. It will be given by men who have made it their business to find out the agricultural condition of the State and who, by experiments and in other ways, have determined what can be done.

Representative GRAFF. Do these experiment stations make it a custom to answer inquiries of that kind?

Dr. TRUE. Yes, sir; to a very large extent.

The CHAIRMAN. The trouble is, the farmers do not avail themselves of it. It is there, but they do not avail themselves of it.

Dr. TRUE. Well, they do not, and they do. There is a large number of farmers in the United States who avail themselves of it.

The CHAIRMAN. But it is not a large percentage of the whole?

Dr. TRUE. No; it is a small percentage of the whole.

Representative WILLIAMS. But every time a man does get some useful information of this kind his neighbors avail themselves of the object lesson he furnishes. So it spreads through him.

Dr. TRUE. Yes. My idea about the farmers in their present condition in reference to this movement is illustrated pretty well by the condition in which I found a farmer with whom I lived in Vermont during my vacation last summer. I do not have many opportunities to get out on a farm, but in vacation time I like to do so.

Representative HENRY. What part of Vermont was that?

Dr. TRUE. It was near Poultney, Vt. There was a man who went into a little valley in Vermont fifty years ago and took up a farm, part of which was bottom land and part mountain land. He has made a success of farming, so that he has got a good living out of it. He has put up good buildings, and now that he is getting to be an old man he has quite a competency, and considerable money in the bank, I judge, though I do not know that. That man has come under the influence of the experiment station——

The CHAIRMAN. You mean under the influence of Dr. True, do you not?

Dr. TRUE. No; I had nothing to do with it. I was there only one month. I helped him a little—that is, I did not help him. I will show you in a moment.

He has gone far enough to apply the results of experiment-station work to a certain extent. For example, he uses the silo, and he builds the silo in the way the experiment station would approve. He sends his milk to a creamery and receives pay for it according to its fat content, and he thinks that is a good thing. He knows the distinction taught him there. He has a spraying outfit and he sprays his apple trees. He knows that is a good thing because it has brought him financial returns that are satisfactory. And so, in other ways, he is adopting the results of experimental work; but he has not, after all, gone far enough, because he has not understood what he might have learned if he had been in an agricultural school in his early days, namely, the need of thoroughness in this work in certain particulars. For instance, in the management of his orchard he still keeps the old idea that it is a sin to cut down a tree, and so he has in his orchard a number of old trees which, in my judgment, are simply breeders of disease. It would be a great deal better if he would cut them away. He has planted out a young orchard, and this year those trees were bearing a great many more apples than they ought. I think the trees were injured by bearing so many; but this old gentleman in his kindly spirit toward the tree, as he thought, did not want to pick off those apples. He is a thrifty New England man and he hates to lose apples or anything else. It would have been a great deal better if he had thinned this fruit; he would have had not so many apples, but more money and better trees.

Then he had not learned, up to the time I went there, that in spraying you must in many cases run ahead of the disease. After I had been at his house a few days his son said to me, "I think there is something wrong with the potatoes. I wish you would go out and look at them." So I went out and looked and, sure enough, the blight was in those potatoes. There was nothing to be done except to dig those potatoes as soon as possible and get what he could out of them. To the superficial observer they looked all right. The vines were luxurious and standing up nicely. In a few days, of course, they were wilted and dead.

The CHAIRMAN. That was last summer, was it?

Dr. TRUE. Last summer.

The CHAIRMAN. That blight was very general.

Dr. TRUE. At that very time there was a poster in the village post-office, sent out by the Vermont experiment station, which told him that the blight was coming, for it had appeared very early in certain places. The experiment station had found it out, and they sent out this warning. It gave him explicit directions as how to treat those potatoes in advance of the coming blight. He had the spraying outfit, and if he had been a little more thorough he could have saved those potatoes.

What was true of that man—he is an intelligent man—is true of his neighbors all around. I saw hundreds of acres of potatoes in that vicinity that were spoiled simply because the people did not know enough to spray in advance of the disease.

The CHAIRMAN. They did not know the blight was coming?

Dr. TRUE. The notice was in the post-office.

The CHAIRMAN. That the blight was coming?

Dr. TRUE. That the blight was coming.

The CHAIRMAN. It came all through my country and we all had it up there. I never saw the notice particularly. Was the notice there?

Dr. TRUE. I was speaking of the Vermont experiment station. I do not know whether the New York station did that or not. I presume they did something. But that is a thing the farmers have got to learn anyhow.

The CHAIRMAN. That is the trouble. They do not avail themselves of the information that is available.

Dr. TRUE. From the rain we had in New York and Vermont this year it was reasonable to suppose the blight would come; and it would have paid to take a day or two and spray those potatoes even if the blight did not come.

The CHAIRMAN. The next time he will do it. He will spray those potatoes.

Representative GRAFF. Whether it comes or not.

Dr. TRUE. Whether it comes or not, he has learned his lesson in that particular case. But I use that particular instance simply to illustrate what is the general condition of many of our farmers. They have received some good from experiment stations. They think it is a good thing. They have received some benefit from it. They might get a great deal more if they knew more, if they more thoroughly appreciated the necessity of doing the things the station wants them to do. I think they have got to get that knowledge in childhood in their schools. That is the general idea I have.

The CHAIRMAN. Old dogs can not learn new tricks.

Dr. TRUE. That is one reason why I am anxious to have some agriculture taught in our schools generally, to start the farmer in the right direction during his early youth.

Representative DAHLE. You are, then, a believer in farmers' institutes, are you, Doctor?

Dr. TRUE. Yes, sir.

Representative DAHLE. Do you cooperate with the State experiment stations in farmers' institutes?

Dr. TRUE. That is what we want to do, and we are asking a special appropriation for that in this item. I might speak about that now.

Representative SCOTT. I think it is just as well here as anywhere else.

The CHAIRMAN. Irrigation does not come under you, does it, Doctor?

Dr. TRUE. Yes; Mr. Mead is here and will speak about that.

The CHAIRMAN. You want to have Mr. Mead speak of that himself?

Dr. TRUE. Yes, sir.

The CHAIRMAN. On page 27 you will find investigations regarding the farmers' institutes. That is a new item. I see you have increased it from $5,000 to $6,000 already. Last year it was $5,000.

Dr. TRUE. Well, we have studied the subject more carefully.

Representative SCOTT. First tell us what you did last year under the appropriation.

The CHAIRMAN. We did not give any appropriation for that, did we?

Dr. TRUE. You gave us a little money that could be used in that direction.

The CHAIRMAN. Under what appropriation?

Dr. TRUE. In the Office of Experiment Stations; but it amounts to only——

The CHAIRMAN. There was no specific appropriation.

Dr. TRUE. No; there was no specific appropriation. The matter was in, but in the conference committee, when they make the last settlement, we suffered to the extent of some $4,000 in the compromise that has to go on there, of course, so we have not been able to do much. But we want to practically make the Office of Experiment Stations the clearing house for farmers' institute work just as it is for the experiment station work. Of course this will be a comparatively small matter, but we want to gather the information that is accessible in this country and abroad regarding farmers' institutes and their work, and make it available to the farmers' institute workers throughout the country. We also want to bring the work of the Department and experimental stations more closely to the attention of the farmers' institutes.

The CHAIRMAN. How would you do that? Tell us how you would do that practically.

Dr. TRUE. We would practically do that in this way. We will have in the Department of Agriculture a small force who will collect the information from different sources. Then these men will go out to the different States and will attend what are commonly called the round-up institutes. That is, in the States where the institutes are best organized they have during the season one or two round-up institutes to which especially the men who are working as lecturers and in various ways actively in the farmers' institutes are invited. They have to come some distance and it involves some expense, so that it is only representative men from the different localities. We hope to meet those men at those institutes and tell them more definitely what the Department is doing and what the experiment stations are doing, and then they will go out as workers in the institutes that follow, and give this information to the farmers generally who attend the institutes. Then, in such a large enterprise as the institute movement is now, with hundreds and even thousands of workers giving lectures and talks in the different institutes, we could help a great deal by coordinating their work and giving them useful ideas.

You gentlemen who have conducted numerous political campaigns of course understand that readily. You formulate the main ideas of your propaganda, and then get together the lesser lights in the political world and instruct them what to say and what to do, and that is wonderfully effective. You understand the advantage of organization along that line. It is something of that kind that we want to do in the way of organization of farmers' institutes.

As a matter of fact, the farmers' institutes are thoroughly organized in only a few States. They need to be much better organized, and we think if we have a little money we can go into the States where they are imperfectly organized, or not organized at all, and help to set that movement on its feet, to show the States what they ought to do and how they can develop the work.

The CHAIRMAN. Who will you show it to in the States?

Dr. TRUE. We will show it to their agricultural and horticultural societies, to their legislatures if we are allowed to do that, to the governors and State officials connected with agricultural matters in a general way.

Representative DAHLE. Do you not show it to the experiment stations?

Dr. TRUE. We show it to the experiment stations, of course. They are already helping as far as they can, but their help is only limited, because they have other duties to attend to. You see we are not attempting to build up a great force in the Department of Agriculture and go out ourselves and hold institutes——

The CHAIRMAN. Will not that be the result of it, Doctor?

Dr. TRUE. I do not anticipate that. This movement, it seems to me, is a movement for the States to carry on as far as the State organizations are concerned.

Representative SCOTT. I think the most effective work that such a division could do in this Department, if not indeed the only proper work for it to do, would be to show the people how they can get hold of the results of the work the Department is doing. Mention has frequently been made here that the people do not avail themselves of it. They do not avail themselves of it because they do not know it is available. I should be in favor of a reasonable appropriation along the lines suggested here for the purpose of acquainting the people with the nature and the extent of the work that is being done, and showing them how they may get hold of the results in such a way as to benefit themselves.

The CHAIRMAN. Would you advise that being done directly to the people, or, as the Doctor suggests, through the institute workers of the various States.

Representative SCOTT. I think the institute workers is the very best way.

The CHAIRMAN. What do you call them—teachers?

Dr. TRUE. Lecturers.

Representative SCOTT. Through the agricultural societies and State boards of agriculture.

Representative DAHLE. Is that the appropriation for $6,000?

Dr. TRUE. For $6,000.

Representative SCOTT. To illustrate what I mean: We have a board of agriculture which holds an annual meeting at Topeka. It has its branches in every county practically of the State, and this State meeting is in the nature of a State convention. I see that by their programme, recently published, Dr. Galloway is to be there to talk to them about the work the Department of Agriculture is doing. That is exactly the sort of thing that might be done systematically with a little appropriation.

Dr. TRUE. That is the idea.

The CHAIRMAN. I suppose not only Dr. Galloway but all your scientists go out in that way preaching and teaching, do they not?

Dr. TRUE. Very rarely. Since I have been in the Department I have been out myself possibly half a dozen times. We have done very little of it, and it is not possible to do very much, with all the other work we have in hand.

Representative DAHLE. Why is it not possible for you?

Dr. TRUE. Because we have so much to do.

Representative DAHLE. Not on account of the smallness of the appropriation?

Dr. TRUE. We had no appropriation for this particular business. This is a new thing. I might say we have gone thus far in the matter: We have held an examination under the civil-service rules for farmers' institute specialists, and as a result of that examination we have an eligible register which, as far as I know about it, contains the names of some men who are very well known in farmers' institute work, and have been successful as managers of farmers' institutes, so that with the appropriation we are asking for we can do a good deal another year.

The CHAIRMAN. If that appropriation is made available, what will be the first steps you would take under it?

Dr. TRUE. The first step would be to appoint this farmers' institute specialist. Then I would send him out to consult with the managers of the farmers' institutes in the different States.

The CHAIRMAN. How much would you have to pay him?

Dr. TRUE. He should be paid a salary of $2,000. That is what we have called for in the examination. He must be a man of experience, and not only a man who knows about agriculture on the scientific side, but on its practical side as well. He must be a good talker and an executive man. We would have to have in the office work some clerical assistance and then there will be his traveling expenses.

The CHAIRMAN. What clerical assistance will he have to have? What is your idea of the establishment of this little work?

Dr. TRUE. He would have a considerable correspondence almost from the start. Even as the result of stirring this matter up we are getting quite a good deal of correspondence about this matter and calls for help from the different States.

The CHAIRMAN. How many clerks would you start him with?

Dr. TRUE. I would start him with but one.

The CHAIRMAN. A stenographer, of course?

Dr. TRUE. As a matter of fact, we want but very little other clerical service in our work. We have to have stenographers.

The CHAIRMAN. The other expenses outside of the chief and the good stenographer and typewriter would be the traveling expenses?

Dr. TRUE. The traveling expenses.

The CHAIRMAN. He would have nothing to do with data. That would all be furnished him by the Department, would it not? It is already in existence now?

Dr. TRUE. Yes; it is all in existence, certainly.

The other matter that comes under my jurisdiction is the irrigation investigation. That, as you know, is a large enterprise, and is therefore practically a division in the Office of Experiment Stations. We have as the head of that a well-known irrigation engineer, Prof. Elwood Mead. I have asked him to come up here and represent me in that matter before the committee, though, of course, I shall be glad to answer any questions.

Representative WILLIAMS. In how many different departments of the Government is this irrigation matter?

Dr. TRUE. We are doing something with it, and the Department of the Interior is doing something with it.

Representative WILLIAMS. Are those the only two?

Dr. TRUE. I think those are the only two that deal with it.

Representative HAUGEN. I understood that these surveys would be dispensed with. I think it was represented here two years ago that it was only temporary.

Representative WILLIAMS. We have added a great irrigation scheme and put it into operation as to public land. Under what departments will that fall, the Interior Department?

Dr. TRUE. That goes to the Geological Survey, of the Interior Department.

Representative WILLIAMS. Then I think it would be a good idea to transfer the whole business to the Geological Survey.

Representative SCOTT. Perhaps we will know better about that after we have heard from Mr. Mead.

Representative WILLIAMS. Nothing he could say could affect the general question of dividing up this irrigation work among so many different people.

Representative SCOTT. I think there might be this difference in it: The work under the irrigation bill which is under the Interior Department might be called purely a mechanical work. It relates to the question of storage of water and conservation of the rainfall, while I think the work conducted in the Department of Agriculture looks to the application and the growth of crops.

Representative WILLIAMS. I understand that, but all of them are cognate, interlacing, intertwining. They ought to be together.

Dr. TRUE. The work in that respect is like the work in a good many other branches of the service. We have a distinct field of operations in the irrigation work. It is just as distinct as the forestry work or as any other work that is done by the Department of Agriculture; but in many ways all branches of the work done by the Department of Agriculture touch the work of other departments.

Representative WILLIAMS. If it barely touches it, that would be all right; but it interlaces with it. We thought we had that forestry transferred. We got the two Secretaries to consent to it, but we found there were two men in the Interior Department who had jobs and they would not consent to it, and they finally kept them from doing it.

Dr. TRUE. The Geological Survey is dealing with the general questions of water supply and the construction of reservoirs. That comes naturally within their domain, because it is their business to determine the natural resources of the country in that broad and general way. But you might just as well turn over to them the work of investigating the plants and the soils and everything else the Department of Agriculture does, on the ground that the Geological Survey deals with the earth, as to turn over the irrigation work.

Representative SCOTT. I think there is a great distinction.

Representative HAUGEN. What was the amount of the appropriation last year?

Dr. TRUE. The amount of the appropriation we are working with now is $65,000.

Representative HAUGEN. We increased it how much?

Dr. TRUE. You increased it last year from $50,000 to $65,000.

Representative HAUGEN. And the year before?

Dr. TRUE. We worked for two years on $50,000. I want you gentlemen to understand that this is not simply a question of arid States when we speak of irrigation. It is a question that affects the country broadly.

Representative HAUGEN. In private conversation with members representing that part of the country two years ago, they said if we should give them the $50,000 they would not ask for it again. It seems, in place of asking for $50,000, they are asking for an increase.

Representative COONEY. What pamphlets do the results of your investigations in irrigation appear in, Doctor?

Dr. TRUE. They are published as bulletins of the Office of Experiment Stations.

Representative COONEY. It comes in the Office of Experiment Stations?

Dr. TRUE. Yes; the Secretary assigns the general management of this work to the Office of Experiment Stations. That was partly because we worked very largely in cooperation with the agricultural colleges and experiment stations.

Representative DAHLE. I have noticed one thing, that among the different publications that are sent out I have received quite a number of bulletins or whatever they may be classed regarding irrigation.

Dr. TRUE. Yes, sir.

Representative DAHLE. I presume as I have received them other members have received them, and I do not know that a single constituent of mine is interested in the subject.

Representative COONEY. They come from the Geological Survey?

Dr. TRUE. He may have received some from the Department of Agriculture. As a matter of fact we have been doing irrigation work in Wisconsin.

Representative **Dahle**. That is very likely, but in our district they are not worth the postage it costs to send them.

Dr. **True**. You do not want it in many parts of the State, but there are parts of Wisconsin where irrigation is practiced.

Representative **Dahle**. So we are spending money for bulletins and it is really thrown away. It would be well that parties who are interested in them should get them, but we are not.

Representative **Haugen**. Do you know the amount of the appropriation for the use of the Secretary of the Interior this year?

Dr. **True**. The appropriation of the Secretary of the Interior is for surveys of reservoir sites, and of course under this new irrigation act he will have millions of dollars at his disposal with which to build reservoirs. We are not dealing with that proposition.

Representative **Haugen**. But there is a special appropriation, as I understand, outside of the regular appropriation made for the irrigation bill?

Dr. **True**. Yes; the appropriation, as I say, is for the study of the water supply and the survey of reservoir sites. They have been doing that for years, before this bill was passed, and are still doing it.

I think, Mr. Chairman, Mr. Mead will not take very much of the time of the committee.

STATEMENT OF ELWOOD MEAD, CHIEF OF IRRIGATION INVESTIGATIONS, OFFICE OF EXPERIMENT STATIONS, DEPARTMENT OF AGRICULTURE.

The **Chairman**. Mr. Mead, go on in your own way and tell us what work you have been doing, what you have accomplished, and the needs of the increased appropriation.

Mr. **Mead**. The beginning of this work grew out of certain general questions which confront irrigators in the West who begun to use streams in irrigation without knowing anything about the subject. The use of Western rivers and the use of the land has begun and developed without any particular plan. As it extended the question of water rights became a matter of very great importance. The lands of that region will not produce anything without water. They are practically valueless without it. The people took the water out of the streams without the establishment of rights and oftentimes without any legislation recognizing the right to take the water out of those rivers. There was no need of any regulation as long as there was plenty of water; but finally a few ditches along a stream multiplied into fifty or a hundred, and great canals were built, and there were more ditches and more farms under cultivation than the rivers would supply. When that situation developed, the man at the head of the stream, if there was no legislation or no determination of rights, had all the advantage. He could take what he pleased. The man at the lower end of the stream took what was left, and if there was nothing left he went without.

Such situations made it necessary to have some sort of legislation, or, where there was no legislation, the determination of rights to water in the courts. As the General Government did nothing, what was done was done by the States, and has resulted in a great deal of litigation over water rights. Those decisions in those were not always consistent, and a great deal of uncertainty and confusion have arisen, growing out of the nature of titles to water, the rights to use streams, and the appreciation of the fact that where there was a great deal of land and not water enough to irrigate it, it was the titles to water rather than the titles to land that was eventually going to govern the value of the stability of every home established in that country.

This investigation in part grew out of that condition of affairs, and it was made one of the first duties of those in charge to study the laws and institutions relating to the use of streams in irrigation, and that was one of the first things taken up.

The reports of this work have shown that in many sections of the West the titles to water already established through litigation amount to no more than the entire supply, and that owing to a lack of knowledge as to the amount required to irrigate an acre of land or to the establishment of any definite principle to govern the establishment of titles to water, a great many rights have been ignorantly established that are speculative in character; that is, they are not based on any real necessity or real use, but have been made largely because people claim more than they needed, sometimes through greed and sometimes through ignorance.

Those are very perplexing conditions, and unless they are in some way untangled it is going in time to result in litigation and hardship and injustice that will be far more expensive and far more injurious than the controversies over Mexican grants of land. It has been the business of this investigation to study those matters, to show what has actually taken place in the different States, what are the conditions under which streams are diverted and used, what is the nature of the titles to water, and what should be done in order to lay a safe foundation for future development.

Representative SCOTT. Is not a large part of that investigation a matter of law rather than of agriculture?

Mr. MEAD. It has to do with the application of law to practical conditions. It is not a matter of law alone, but it is a matter of studying what has been the result of laws when they are made to operate on the stream and in the field.

Representative GRAFF. It might call for a movement to enact some new law?

Mr. MEAD. Yes; it undoubtedly will.

Representative GRAFF. For instance, to avoid certain conditions.

Mr. MEAD. The collection of records of claims to water and titles to water showed what was generally well known in the West before that in many instances. These rights were in excess of the flow of the streams, and certainly in excess of actual uses, because a considerable amount of water was still going to waste. Now, in order to get on a safe basis we should have rights established in accord with actual necessities and actual uses; you must be able to show definitely and beyond question what are the necessities of an acre of land.

The next branch of our work has been a study of the duty of water. The establishment of an approximate standard for the duty of water; by that I mean the amount of water required to irrigate an acre of land. This is as necessary in the development of an irrigation system and in the division of a river among users as the establishment of some standard of value is in commerce and trade. We had to show what was the actual volume of water being used, because without this our statement that more had been decreed than was needed would not be heeded.

So we have to take up the measurement of the amount of water turned into canals and the amount of land that it irrigated to show how much water is actually used under present methods. A great deal of that water is lost in transit through the canal. We had to measure these losses. Some canals act like a sieve. The water that is turned into the channel goes out through the sides and bottom like it would run through an ash heap. There are two things which have to be determined—one is how much water is needed by an acre of land when measured at the margin of the field, the other when measured at the border of the stream, because there is where the division of the public water supply has to be made.

The sort of information is needed in order to show to the legislatures, to courts, to whoever has to determine the title to water, what is the proper basis for a water right. These have been carried on in a large number of the Western States in order to deal with the diversified conditions of the soil and climate and productions.

One of the results of that work has been to show that the losses in transit through canals have been very much larger than had generally been supposed, and one of its practical results is that it is leading to a great deal of improvement in the construction and maintenance of canals. I have no doubt that the saving to the West in water before wasted has over and over again repaid every dollar that the Government has appropriated for this investigation.

The CHAIRMAN. Did not common sense teach them that they would lose a great deal of water naturally in these ditches?

Mr. MEAD. They did not understand how much was being lost and did not appreciate the gain which was possible. It was not until we brought the figures before them and showed that the 40 per cent or 50 per cent, in some cases 75 per cent, of the water turned into the head of their canal was going out where it did them and no one else any good, that they began to realize the necessity for improvement in this matter.

Those were the two general lines of work which occupied our entire attention and entire appropriation for the first two or three years. When the reports of the work done began to be read and the men engaged in this work became acquainted with the people in the States where these investigations were being carried on, we began to get a great many practical inquiries from farmers on other features of irrigation. Farmers wished to know how to water their fields to better advantage. These inquiries we believed ought to be answered, because they came from men who probably were farming under irrigation for the first time. Sometimes we get as high as twenty letters a week of that kind from men who have recently gone to the arid region.

The CHAIRMAN. What are your experimental stations doing on those lines, in giving that information that they apply to you direct for; why should they not go to their experimental stations within the State?

Mr. MEAD. I will take that up a little later and show what has been the reflex action of this investigation on the experiment stations themselves.

The CHAIRMAN. Very well.

Mr. MEAD. A gentleman told me last year when I was out West:

> I visited a certain river and I saw on all of the ditches along that river the best set of head gates I had ever seen. They were so much better than anything I had seen elsewhere in that State that I made inquiry and found that some gentleman had written to your office for a plan of a head gate for ditches. It had been furnished him, and every other owner of a little ditch along that stream patterned after him, and so the example had spread.

There has been a great deal of indirect benefit—benefit that was not planned—that has come out of that work through practical advice and suggestions sent out from this office.

When we took up these studies we needed first of all men of more than average judgment and experience to make these studies of water rights and water records. We had to get first-class men, and a first-class irrigation engineer in the West is expensive, and we could not take them away from their professional pursuits and employ them all the time, except very few of them; but the experiment stations in the Western States have a number of the best-informed irrigation engineers on their teaching or station staff—not so many at first as they have now. What we did, wherever possible, was to enlist the experiment stations of the West in a cooperative arrangement by which we would hire between us an irrigation expert who had demonstrated his superior ability in this work, and we have, since this work started, secured the employment in some three or four of the Western institutions which were giving no attention to irrigation problems before, some of the best-known irrigation engineers in the West. Between us we can pay the salary necessary to get them, and we are using their services during the summer season in field work, and the college is using them in the winter as a teacher or in experiment-station work.

I can mention as examples of these cooperative arrangements Nebraska, Montana, and California, three important States; but at the time this work began there was no irrigation engineer in the University of California. These water problems have been developing rapidly, and their ultimate importance was not appreciated until in recent years. As long as there was an abundance of water people held to the idea, that they had carried with them from a rainy country, that water, like air, ought to be free to everybody alike, and that belief led them to antagonize any close investigation of these questions.

The result of our cooperation with the Western stations is that we are strengthening their work, because we are enabling them to hire better men and do more and better work. We are bringing about uniformity in methods of investigation. We are standardizing methods so that one can compare what is being done in Arizona with what is being done in the State of Washington. We have in every one of these Western States one of the men who stands highest locally in their professional rank as an irrigating engineer looking after our work. We have only been able to do it through our cooperation with agricultural colleges and stations and with the State engineers, because we are cooperating with them as well.

It is of the greatest importance to the whole country that water should be used by irrigators to the best advantage because there is a great deal more land than can be watered, and the higher the efficiency of the irrigator the larger the crops and the more acres we will be able to irrigate with the water we have. We want those titles established on a just basis, so that one man will not acquire a surplus right to a stream and hold others on that stream in perpetual bondage to him. A water tenancy would be worse than a land tenancy, and it is necessary in order to prevent that to know how much water is needed for an acre of land. I believe that that is going to be the outcome of these investigations because it has done a great deal to awaken public sentiment. Associations for the reform of irrigation laws have been organized in nearly all of the arid States.

Representative WILLIAMS. In a great many of the States out there have they not already granted their water rights so extensively that they will have to proceed to public condemnation in order to get them back?

Mr. MEAD. The chief difficulty is that there has been no definite establishment of titles to water. I received a letter yesterday from Bozeman, Mont., which calls attention to the fact that 98,000 acres of land are irrigated from that stream. Some of that land is worth $100 an acre. Yet there is not a single definite title to water from that river.

Representative WILLIAMS. There is no law on the subject so far as that river is concerned?

Mr. MEAD. The law is declarative, but it is not operative, because there are no officials——

Representative WILLIAMS. The legislature of Montana has full swing in that particular stream. They can do as they please, but in most of the States out there have they not enacted legislation whereby they have given or sold or conceded water rights so extensively that people can hold up a whole river, five or six times as much water as they want, and make other people pay them, and will they not have to condemn those water rights, just like you condemn land for public purposes, after awhile?

Mr. MEAD. It may be so, but it is not settled that it is certainly so yet, and I hope it will not be.

Representative GRAFF. Is it not true that the legal principles of irrigation rights are not very clearly established?

Mr. MEAD. That is true.

Representative GRAFF. That is, the fundamental principles.

Representative WILLIAMS. It has to be statutory law. There is no English common law bearing upon it, because the common law did not come from an irrigation country.

Mr. MEAD. Let me explain the history of a great many of those rights. People take out ditches without authority from anybody. They may file a record claiming a certain amount of water, but they take every ditch without any permission from State authority or without any process of law. Those ditches will be scattered along the stream, and if a ditch is a few miles above mine and takes the water which I need I feel aggrieved at that single ditch owner, while the real injury may come 40 or 50 miles above from other ditches; but I do not see that, and I bring an action against my neighbor. It is just an ordinary action at law between us two individuals. We litigate as though we owned the stream—as though it was our private possession. The public is not concerned in that litigation at all. The court decides that my neighbor has a certain right and that I have a certain right. That is conclusive between us, but it is not conclusive between us and the public if the public is the owner of the stream. The great question to be settled in the West is whether the real owner of those streams has ever had his day in court in this litigation.

Representative GRAFF. In other words, the litigants both presume they have rights between them to litigate.

Mr. MEAD. Yes; and they have, as between each other.

Representative GRAFF. But the fundamental question has not been determined as to whether either of them has any right or not.

Representative WILLIAMS They proceed along the idea that the stream belongs to the people and the people do not undertake to control it.

Mr. MEAD. There is no doubt that when this subject is appreciated these matters are going to be settled on a different basis.

Representative DAHLE. Is it now first come first served, largely?

Mr. MEAD. Well, yes.

Representative DAHLE. Is that about the outcome of it?

Representative GRAFF. It is the one that was there first.

Mr. MEAD. The one that was there first, yes. I wish now to speak of a new feature of this investigation, inaugurated this year through an amendment to our appropriation bill by Congress, which requires us to investigate and report on the institutions relating to the use of water in irrigation and to the rights of riparian proprietors. Riparian rights is one of the most perplexing and most troublesome questions that concern irrigation in the West. The streams that flow east from the Rocky Mountains all flow into a region where the common-law doctrine of riparian rights has been recognized from the first settlement, and those riparian proprietors along the streams have certain interests in the water supply. What are they? It is a question still to be determined.

Representative **Graff**. Did not the Supreme Court recently hand out a decision where there was sought to be an injunction on the part of either a State or people living in one State against the people in an adjoining State? In other words, just what rights the people might have to take the water out of a flowing river and divert it for the purposes of irrigation, and thereby deprive the servient country or the people in the State on the stream below from enjoying the benefits of that river? Was there not a decision handed down involving some such situation as that recently?

Mr. **Mead**. The State of Kansas has brought suit against the State of Colorado over the rights to the joint use of the Arkansas River, but no decision has been rendered; in fact, the issues have not been made up and the case has not been argued.

Representative **Scott**. Let me make this statement in connection with that case. The matter was heard before the Supreme Court of the United States last year, but the only question at issue then was, I think, possibly, on a demurrer, and the court held that Kansas probably had a ground of action and they would go into the merits of the case.

Representative **Williams**. They refused to dismiss on a demurrer?

Representative **Scott**. They refused to dismiss and a commissioner was appointed to take evidence, and the case is to be heard on its merits at some later date; but the decision of the court held that Kansas probably had some rights in the premises that at least justified the court in investigating.

Representative **Graff**. That might be a very vital thing in connection with irrigation.

Mr. **Mead**. We have taken up the study of the issues already raised in one stream, the Platte River. The Platte River rises in Colorado, both branches of it. One branch flows down through Colorado into Nebraska. Another one flows north into Wyoming and then into Nebraska and finally empties into the Missouri. All three States have recognized the doctrine of appropriation—that is, the right to divert and use a stream on nonriparian lands in irrigation—but each of them has a different law, different in some of its details, different in some of its administrative features; and we have first the question of the respective rights of the people in those three States, who are appropriators of land, who have taken the water out to use it on nonriparian lands. Then we have the question of rights of riparian landowners and riparian interests down in Nebraska, where the common-law doctrine of riparian rights is also recognized, and what we intend to do is to ascertain the actual uses of water, the nature of the titles to water in streams.

The **Chairman**. Are you a lawyer by profession, Mr. Mead? You are an irrigation engineer, are you not?

Mr. **Mead**. Yes.

The **Chairman**. But you are not a lawyer?

Mr. **Mead**. Well, I was admitted to the bar. I never practiced.

Representative **Haugen**. These points you have referred to are legal points, are they not?

Mr. **Mead**. They are; but the very foundation of irrigation and agriculture in the West is the title to water. It is far more important than the title to land.

Representative **Scott**. That is the reason I asked the question a moment ago as to whether this inquiry was not fundamentally a question for the law officers of the Government to investigate and determine.

Representative **Williams**. But the point Mr. Mead makes is this, that the law officers can not determine——

Mr. **Mead**. The facts.

Representative **Williams**. What is a sufficiency of water, and the general rule of law fixing the right of the land proprietor must depend upon the ascertainment of that fact.

Representative **Scott**. I can easily understand how a lawyer appointed to investigate the titles to water might run up against this lack of information and call upon the Department here to furnish the information, but when the Department has furnished that information, it looks to me as if the question harks back to the lawyer again.

Mr. **Mead**. It is going to become a law question.

Representative **Williams**. It is a law question, but a law question of applied science.

Representative **Graff**. Here are principles of law to be applied to a new industry, and the law that is to be evolved must depend largely upon the fact.

Representative **Williams**. The science of irrigation.

Mr. **Mead**. And securing the scientific part of it, it seems to me, is really the larger part of the question and is the beginning at least of the solution of it.

In connection with what Mr. Scott said, the Supreme Court refused to rule on this demurrer, because they said they felt that the facts set up by Kansas in its original complaint, and the counter statements made by Colorado when it demurred, were of so much importance that they did not feel like passing on the legal questions involved in the settlement of this matter without first acquainting themselves with the actual physical facts which covered the use of that stream.

In carrying out the investigation taken up under the amendment last year we felt that it dealt with the rights of so many homes and had such far-reaching results that we wanted first of all to know what the sentiment of Western communities was regarding it. I went West this year and conferred with the State authorities of Kansas, Nebraska, Colorado, and Wyoming about the stream that we should take up and the wisdom and propriety of taking it up at all. Without any regard to whether a State was at the headwaters of the stream or down below, they all welcomed it. It was the opinion in both Kansas and Colorado that we should not take up a stream that was already in litigation; that that was a matter in which feelings were already aroused, and that our conclusions in a case of that kind might seem to favor one litigant more than the other rather than be entirely unbiased; and that is what led us to pass the Kansas River and take up the Platte River, a stream on which no controversies at present exist. This is a fundamental question in my judgment to irrigated agriculture.

Carrying out this work it has led to development along a number of lines that we did not anticipate in the first place. The discussion of irrigation has aroused a great deal of interest in the East and the feeling is growing that irrigation is destined to have a great influence in promoting the success of agriculture and horticulture in the humid States, because they irrigate in France and Italy where they have a greater rainfall than in many of the States in the Mississippi Valley and east of it, and the rainfall is equally well distributed. So that we have many inquiries, and a good deal of time is taken up in answering inquiries from eastern parts of the country about the possibilities of irrigation and the best methods of applying water, where it would pay to make the experiment, and where it would not be profitable. In a few cases irrigation in the humid States has assumed an importance as great as in the West. The rice districts of Louisiana and Texas are one illustration of that.

Representative WILLIAMS. By the way, we have the largest rainfall of any part of the United States in the Lower Mississippi Valley, and yet a gentleman up about Greenwood, Miss., made some experiments last year and the year before that in irrigating in the valley for corn, and he produced about twice as much corn to the acre as was ordinarily produced. It shows that some day everybody will irrigate, will try to control the water to some extent, even in countries were hitherto it has been thought absolutely unnecessary.

Representative HENRY. What is your average rainfall in Mississippi?

Representative WILLIAMS. I do not remember, but it is larger than in any part of the Union in the Lower Mississippi Valley.

Representative GRAFF. The idea was to give the land water where it needed it.

Representative WILLIAMS. Where it needed it; yes. He made 75 to 80 bushels of corn an acre without fertilization, just with water.

Representative HAUGEN. The water itself fertilizes the ground, does it not?

Representative WILLIAMS. I do not know, but it put the water there when it was needed. It has a mechanical action upon the soil that is equal to fertilization, and then there is some degree of fertilization in the water, too; but this was clear artesian water, so there was very little mineral substance in it.

Mr. MEAD. In the humid States we are cooperating in a systematic way with the State experiment stations of Missouri, of Wisconsin, and of New Jersey. In Missouri the question is, as far as we have dealt with it, the benefits of irrigation in the growing of fruits, both small and standard fruits.

The CHAIRMAN. Are you going into what you might call the agriculture of irrigation? I thought that was prohibited.

Mr. MEAD. No.

The CHAIRMAN. What was the purpose of sending this expert to Egypt? That was spoken of the other day.

Mr. MEAD. That was in respect to the irrigation laws and customs of Egypt.

The CHAIRMAN. I thought it was in regard to what I call the agriculture of irrigation.

Mr. MEAD. There were two experts there, one from the Bureau of Soils.

The CHAIRMAN. Did you send one?

Mr. MEAD. Yes; about their laws and institutions, entirely.

The CHAIRMAN. Are you two bureaus going to duplicate each other's work?

Mr. MEAD. No, sir; not at all. Our fields are perfectly, clearly defined.

Dr. **TRUE.** They are studying the alkali problem.

The **CHAIRMAN.** They seem to have studied all problems, from their statement here the other day. You were touching on the fruits?

Mr. **MEAD.** Yes; the principal aid we have given them is to enable Prof. H. J. Waters to carry on the investigation, because nearly all the expenses have been paid by the State. We have assumed certain direction over their work and have paid enough of the expenses to entitle us to a report, and that is as far as it has gone.

His conclusion is that in the growing of nursery stock you can afford to expend $100 an acre in providing a water supply. That is simply one illustration. Another illustration of the results of what we have done in the humid section is given in a letter I received this week from Mr. Hamilton Yancy, of Rome, Ga. He came here last spring and told me he intended to put in a pumping plant on his farm, because for five years he had failed to raise a full corn crop, through the disastrous droughts of the summer. If he had gone on with his original plan, the experiment would have been a failure, because his plan did not contemplate furnishing enough water; and that is the general mistake of people who propose to irrigate in the East. He put in a pumping plant, and all of his crop that was not irrigated was a complete failure. The corn that was irrigated yielded 60 bushels to the acre, and some of it was almost ruined before he began.

We have assisted with advice and direction in regard to quite a large number of attempts at irrigation throughout the South, more in the South than anywhere else. That seems to be the field where pumping water for irrigation in humid sections will pay best, and there is a great deal of interest in it, and a great deal of money going into it; and so far the results have shown a very large increase in production and a great gain in securing the insurance it gives against a complete failure. So that I believe the benefits that are coming to agriculture in the East from this investigation is worth a good deal more than it is costing.

Representative **DAHLE.** How is the water pumped; with what kind of power?

Mr. **MEAD.** In Mr. Yancy's case he used wood, with a steam engine. He used wood because that was on his own farm.

Representative **HAUGEN.** What are they using in Texas on the rice fields, oil?

Mr. **MEAD.** Oil almost entirely now. They did use wood at first. Oil is the most economical fuel.

Representative **HAUGEN.** How many horsepower does it take to run a 5-foot pump?

Mr. **MEAD.** That depends on the lift.

Representative **HAUGEN.** Lifting the water, say, 30 feet.

Mr. **MEAD.** About a 35-horsepower engine, taking an 8-inch discharge pipe running from the pump.

Representative **HAUGEN.** A 5-foot pump would fill an 8-inch pipe, would it?

Mr. **MEAD.** Yes, sir; more than do it.

Representative **HENRY.** What about your New Jersey experiment, Mr. Mead?

Mr. **MEAD.** Up to this year the New Jersey experiment has shown a very decided financial gain for the irrigated.

Representative **HENRY.** Southern New Jersey?

Mr. **MEAD.** Yes, sir; everywhere; and it is the conclusion of Professor Voorhees that it will pay almost any farmer in New Jersey to have a plant of irrigation for from 1 to 10 acres. It will not pay for general crops, but it will pay for gardens and intensive cultivation.

Representative **Dahle**. What about your Wisconsin experiment?

Mr. **Mead**. The Wisconsin experiments were undertaken, in the first place, to determine what could be done with the irrigation of the sandy lands of northern Wisconsin, that are practically valueless without it.

Representative **Dahle**. Sandy marshes?

Mr. **Mead**. No; the sandy uplands.

Representative **Dahle**. Where did you begin?

Mr. **Mead**. We began at Stevens Point. It paid to irrigate there this year, although the rainfall was altogether exceptional. We had between 8 and 9 inches in one month—the month of May; but the profit was very small. The profit was a dollar or two an acre, and on one particular patch there was a loss, but in one case it was $5 an acre.

In a general way in the East the question is whether irrigation will pay. The chances of its paying are better with high-priced land and crops that have a very high acreage value. We do not want to begin on land that is not fertile and where the crops have a low return, because it does not pay in that kind of agriculture to make the outlay to furnish the water.

So in Wisconsin we have changed the location of these studies, and we have been looking for the last two years into the irrigation of cranberries to see what changes are necessary there to make the cultivation of that crop a success; there is a great demand for the product. There are large areas there that seem to be well adapted to it, and its future extension is a question of methods.

Representative **Dahle**. What counties especially?

Mr. **Mead**. Well, I do not know where all the locations are.

The **Chairman**. Coming to this new language that is italicized, it says: "Different kinds of power for irrigation and other agricultural purposes, and upon plans for the laying out of farms, water and sewerage systems for farms, farm buildings, and farm machinery." Do you think you ought to go into that?

Mr. **Mead**. I think there is an opportunity for some branch of the Department to go into it.

The **Chairman**. Is not that rank paternalism?

Mr. **Mead**. No; I do not think so. I will tell you how we grew into making some study of those things. The inquiries that came to us for pumps wanted to know the best kind of pump to use, the best kind of power to use; and there were questions, too, as to whether you could use streams for doing farm work. Those inquiries compelled us to give more or less attention to these things, more attention than I had ever given to them before, in order to answer the inquiries intelligently.

The **Chairman**. Are they legitimate inquiries?

Mr. **Mead**. I think so.

The **Chairman**. You might as well go on and tell a man the Government will take hold of the whole farm as to tell him how to build his buildings, what kind of buildings he ought to put up, and all that. I think that is a tremendous step.

Mr. **Mead**. I do not think with the appropriation there we will go very far, but I do think there is an opportunity to do a great deal of good with a very little expenditure of money in the way of advice; and I think that the object of it is the general promotion of agriculture in this country, and that wherever you can get a large return in the way of more profitable agriculture it will pay to make the expenditure.

I would prefer to have Dr. True take up this question of farm machinery, as that is a matter in which he is interested as well as myself.

The **Chairman**. Just touch on that, Doctor.

ADDITIONAL STATEMENT OF DR. A. C. TRUE, DIRECTOR OF THE OFFICE OF EXPERIMENT STATIONS, DEPARTMENT OF AGRICULTURE.

Dr. TRUE. The language of the bill has been changed so as to broaden our work out to cover the general subject of agricultural engineering. That is a matter that has been dealt with in this country as yet very little, and yet we are the largest users of farm machinery and, in a general way, of the principles of agricultural engineering of any country in the world.

The agricultural colleges—I have to come back to them, because our work joins them in every point—the agricultural colleges in recent years have recognized the fact that their courses of instruction were weak along this line, and they are seeking to develop them. Now, when they take up this work they find that they have not the information that is necessary to formulate good courses in agricultural engineering. Almost nobody in this country has been at work collecting that information. If we get it at all, as far as matters of principle are concerned, we have to go abroad for the information. In France, Germany, and Russia they have institutions that are giving their time very largely to investigating the problems of agricultural engineering, the principles on which machines and buildings should be constructed, and the way in which estates should be laid out, and all the various branches that might properly be called agricultural engineering.

Let me illustrate one phase of that, to show you how the subject is coming out. I was out at the University of Illinois the other day, and they have lately introduced there a course in farm machinery. They have a large room in their new agricultural building in which they gather the different forms of agricultural machines. Some of them, as you know, are very complicated. It almost takes an expert engineer to manage them. They are taking their students into that place, and, under the eye of a competent instructor, the young men are taking those machines apart and seeing how the parts are constructed, and, besides that, what are the principles involved in the construction of machines for particular purposes. In that way they are giving the boys some very useful information and education along that line; but, as regard investigations, that matter has been dealt with in this country almost wholly as a commercial proposition, and undoubtedly there are many ways in which our farm machinery might be improved and simplified and better adapted to its purpose, if we could unite in the making of those machines other lines of agricultural science.

The farm machine manufacturers themselves recognize that. We have made some special inquiries along that line. They say they wish the agricultural colleges could furnish them with men who have been educated not only in engineering lines, but also in the lines of agricultural science, so that when they undertake the making of a particular machine the man who is to construct it or approve it would have a definite knowledge of the principles underlying the use of that machine in agricultural as well as the ordinary engineering principles which are involved in the handling of the iron or steel in the making of the machine.

So that we want to do in the Department of Agriculture along this line of agricultural engineering just what we are doing along other lines. We want to develop the information regarding the principles, the scientific basis, of the whole thing, which will be of use to our farm people.

The CHAIRMAN. What is the scientific use of a farm building, Doctor.

Dr. TRUE. For certain farm buildings there is a good deal of scientific basis. The construction of a real good barn for the use of animals in some parts of the country——

The CHAIRMAN. That is the duty of the builder, the carpenter, not of the Government.

Dr. TRUE. As regards investigations concerning the principles of construction, not any more than it is to find out through feeding experiments how to put flesh on a cow in the best way.

Representative SCOTT. I have been contemplating the erection of a building for use as a printing office. Would it not be the duty of some branch of this good Government of ours to furnish plans for the utilization of that space?

The CHAIRMAN. On a scientific basis?

Representative SCOTT. On a scientific basis.

Dr. TRUE. I do not know that there is any branch of the Government at work at that particular thing now.

Representative SCOTT. I use that, of course, to illustrate a comparison.

Dr. TRUE. Of course the wording of the item may have been unfortunate as suggesting the idea that the Department was going into a scheme to furnish private individuals with definite plans for buildings to suit the needs of individuals.

The CHAIRMAN. That will be the next step of it, Doctor. It does not make much difference what the wording is, those will be the next demands made upon you.

Dr. TRUE. In one sense it is a new step; in another sense it is not a new step. Take the agricultural colleges and experiment stations as a whole, and they are dealing in a small way with all the things included in the language of that bill.

The CHAIRMAN. This language reads: "And upon plans for the laying out of farms, water and sewerage systems for farms, farm buildings, and farm machinery."

Dr. TRUE. Yes.

The CHAIRMAN. I think under the language of that act I could send to the Department here and simply demand that they furnish me a plan for laying out my farm.

Dr. TRUE. But that clause, as I understand it, is connected with what precedes it, so that we are to make investigations upon plans, not to furnish the farmer with plans.

The CHAIRMAN. For instance, Mr. Mead said you furnished him with plans for a head gate, which has been generally adopted.

Dr. TRUE. What Mr. Mead meant by that is this: We made an investigation on head gates and determined on different plans. Then we published that information in a bulletin. We did not furnish specific plans for a particular head gate on a particular stream. That is not our business.

Representative GRAFF. There was a bulletin issued during the present year on farm buildings.

Dr. TRUE. Certainly.

Representative GRAFF. I know I received some of them.

Dr. TRUE. Here is the situation in the Department of Agriculture at present with reference to farm machinery—there is nobody there who even knows the names of all the farm machines that are used in this country.

Representative SCOTT. Why should there be anybody there?

Dr. TRUE. If we are to have any interest in it at all, I do not see why there should not be. The basis on which the Department of Agriculture, as a whole, rests is that it is to gather and diffuse information regarding agriculture in the broadest sense of the term. That is the language of the act.

Representative SCOTT. In the broad sense it is true, but not in the very minute sense, it seems to me, of carrying on investigations along lines that every man must very largely determine for himself.

Dr. TRUE. But it is not my idea that we shall do anything different as regards this agricultural engineering from what we are doing in other lines of investigation.

Representative SCOTT. Just one further thought. I do not see how you can go into the question of farm machinery without laying yourself liable at least to the charge of booming one man's machine or knocking out another man's machine.

Dr. TRUE. That seems to me to be easy. There is in the city of Paris an experiment station for the study of farm machinery. They take different machines, or they attempt the construction, in some cases, of machines. Their object is not to boom one machine or another, not to give out the statement that this man's mower is better than that man's mower, but to determine the principles on which mowers should be constructed; that is, they try to do for machinery exactly what the Department is doing with reference to soils, or plants, or animals. I can not see any difference.

Representative SCOTT. I think still you might give out a bulletin, outlining the principle upon which a mowing machine should be constructed, which would make it so clear that a certain mowing machine met all the requirements that anyone familiar with machines could easily apply it.

Dr. TRUE. We should have to guard that point.

The CHAIRMAN. What is the practical experience of the scientists of the Department in erecting farm buildings, for instance, or in farm machinery?

Dr. TRUE. The trouble is now there is nobody down there who knows anything about it. That is what I am trying to get at. I think the Department is lamentably weak along that branch of agricultural science, which is a very important branch.

The CHAIRMAN. I take it the agricultural machine men are taking pretty good care of their machines all over the country.

Representative SCOTT. Would not such investigations involve very large expenditures? Would you not have to have a great machinery hall?

The CHAIRMAN. You would be immediately subject to the pulls and hauls of competition among the different manufacturers.

Dr. TRUE. I do not think it involves any more trouble than investigations along other lines.

Representative DAHLE. Do you think it is necessary to go any further than the States are now doing? For instance, in our State of Wisconsin there are experiments carried on at the experiment station in regard to cream separators and cream churns, and I have no doubt as to binders. Can not that better be done by the different States which have the stations themselves?

Dr. TRUE. My answer to that is just the same answer I make to a proposition regarding any of the work of the Department. Just as far as we can we will cooperate with the State institutions, and if this appropriation is granted us for this purpose one of the first places we should want to go to and work would be the University of Wisconsin, because they have what we have not—the plant and the experts with which to begin operations.

Representative DAHLE. Do you do any more than issue bulletins at the conclusion of your experiments?

Dr. TRUE. Certainly; we would issue bulletins.

Representative DAHLE. That is all you would do?

Dr. TRUE. That is all we would do.

Representative DAHLE. You would not expect to buy mowers and reapers and churns, and this thing and that thing?

Dr. TURE. No. One thing the stations have learned in the experience they have had along this line is that they must be very careful in their investigations not to boom any particular machine. They try to make bulletins of a nature which will explain to the farmer the principles on which a good machine should be constructed, and then, of course, let him buy his machine wherever he can buy one that carries out those principles best.

Representative SCOTT. Would it not require an expert machinist to determine whether the principles which you outline do find their exemplification in a certain machine?

Dr. TRUE. Certainly, in an exact way; but the farmer might determine it well enough practically.

Representative SCOTT. In other words, would it do the farmer any good if he had a bulletin laying down the principles which should govern the construction of a machine? Could he, with that bulletin in his hand, go into the market and buy a machine?

Dr. TRUE. I think he could buy it better. Take this matter of the separators. In this stations have done considerable useful work in pointing out to the farmer certain requisites which good separators must have.

Representative HASKINS. The manufacturers of farm implements put up a legend at every quarter section and send out an expert with every machine. Is it not possible they can enlighten the people on the subject of the merits of the machinery and put it in operation successfully?

Dr. TRUE. The manufacturers deal with all these questions from the commercial standpoint. You could have said the same thing a few years ago with reference to the manufacturers of commercial fertilizers. They are abroad in the country selling their goods, and each man is explaining the merits of his own fertilizer. Now, the experiment stations have come in, and without interfering with the business of the manufacturers, they have put the thing on a better basis. The experiments of the stations have shown the kind of fertilizer to be used.

The CHAIRMAN. The kinds of fertilizers for different purposes?

Dr. TRUE. Certainly. That is all we intend by these investigations in reference to farm machinery.

Representative HAUGEN. It is rather to assist the manufacturers?

Dr. TRUE. Certainly; in that respect this work would be on just the same basis as that of the other work of the experiment stations and the Department of Agriculture.

The CHAIRMAN. Was that the purpose for which you needed this $10,000 additional on the irrigation appropriation?

Dr. TRUE. If we had the $10,000 additional we could carry our investigations a little farther in that direction. I do not think we could cover the entire language of that bill. We would be permitted, then, to make beginnings in certain lines, which would not cost us very much. For instance, take this matter of farm machinery. As I say, there is now nobody in the Department who attends to this. Our idea would be to gather, in the first place, the information that would be necessary to determine what the further investigations should be.

The CHAIRMAN. I was out for a minute. What progress has been made in inducing the States to pass uniform laws governing irrigation, the water supply, etc.? I remember when we first made this appropriation that was the reason it was made, because the streams running through different States, and each State having different laws affecting that water, there was no head or tail to it; and I remember when it was first impressed upon this committee the need of this appropriation, that was the one great object that was sought to be attained.

Mr. MEAD. I will just give you one object lesson in regard to it. In the beginning this was a situation which was not realized anywhere. There is a general interest in it now.

The CHAIRMAN. How long have we been making this appropriation?

Mr. MEAD. Four years.

The CHAIRMAN. Have you succeeded in getting the entering wedge for uniformity?

Mr. MEAD. Yes, sir.

The CHAIRMAN. Whereabouts?

Mr. MEAD. There has been a very marked improvement in Idaho. There they have created the office of State engineer, and instituted a large measure of public control. They have done the same thing in Utah. They passed a county law in Nevada.

The CHAIRMAN. A county law?

Mr. MEAD. A law for county supervision. Those are cases of actual legislation, but there are associations at work on this matter in every one of the States. There is an association in Washington, in Oregon, in Montana, and one in California.

The CHAIRMAN. That are working to this end?

Mr. MEAD. Yes.

The subcommittee (at 5.20 o'clock p. m.) adjourned until Wednesday, December 17, 1902.

SUBCOMMITTEE ON APPROPRIATIONS OF COMMITTEE
ON AGRICULTURE, HOUSE OF REPRESENTATIVES,
Washington, D. C., January 8, 1903.

The subcommittee met at 10.30 o'clock a. m., Hon. J. W. Wadsworth in the chair.

The CHAIRMAN. Gentlemen, we will hear Mr. Pinchot this morning.

STATEMENT OF GIFFORD PINCHOT, CHIEF OF THE BUREAU OF FORESTRY, DEPARTMENT OF AGRICULTURE.

Mr. PINCHOT. Mr. Chairman and gentlemen of the committee, on returning to the United States I was struck first of all by the immense and increasing need for forest preservation. I had no sooner landed in San Francisco than news reached me of recent forest fires in Oregon and Washington, the loss from which was nearly $13,000,000. Along the whole line of the railroad coming east, where it passed through wooded regions, evidences of forest destruction were common, and the need of proper protective measures struck me more and more strongly from day to day. It was an old impression renewed with uncommon strength, and it became more evident to me than ever, that we are face to face with the question whether or not the remnants of our forests will be saved. There is only one road along which forest preservation can go. As the President has said, the keynote of forestry is the perpetuation of forests by use. Our timber lands can be saved only through wise methods of handling, and such methods can not be adopted unless it is made possible for the Bureau of Forestry to do the necessary work.

When the forest work of the Agricultural Department was reorganized, now more than four years and a half ago, it was doing no work whatever on Government forest land. Now the very great majority of the expenditure by the Bureau of Forestry is for distinctly Government work, and much of the remainder is for the various States. For example, in addition to the working plans requested by the Department of the Interior for the 60,000,000 acres of Government forest reserves, a similar request has been made by the War Department for all the military wood and timber reservations, and recently the Department of the Interior has begun to refer to us all questions of cutting on Indian reservations. Many of the States, such as North Carolina, Maryland, New York, Maine, and Michigan, have already made considerable appropriations for work within their boundaries by the Bureau, and California is proposing to appropriate $20,000 for the same purpose at the present session of the State legislature.

The expenses of the work done for private owners of timber land are borne by them. Much of the work done at the request of private persons, while it is directly useful to them, is also of great value to the Government, and in very many cases would otherwise have to be done wholly at Government expense. For example, one of the important tasks of the Bureau of Forestry is to ascertain the rate of growth per tree and per acre of the valuable commercial timbers, in order to answer the question whether it will pay the owner to meet the cost of taxes and other expenses while waiting for a second crop. The preparation of tables of growth of this kind is everywhere recognized as a proper Government function, and a good deal of it has to be done purely at Government cost. Nevertheless, our most important tables have so far been paid for, except for the salaries of the men who made them, almost entirely at State or private charge.

The different lines of work which the Bureau is now following out are so numerous that I can not detain you to mention them all. One of them, of which Mr. Price has already spoken, is the investigation of the turpentine orcharding in the South, which has already yielded such admirable results. The turpentine operators are rapidly adopting the method devised by Dr. Herty, a member of the Bureau of Forestry, who has demonstrated that the application of the Bureau's method during the last season would have meant an increase of revenue to the South of about $13,000,000.

Investigations of tan barks in general, Western tan bark oak—One of the most valuable trees of the Pacific coast, which is rapidly being destroyed, of substitutes for the spruce and poplar in the manufacture of paper, of the economical use and preservation of construction timbers, including railroad ties, the latter in cooperation with the Bureau of Plant Industry, of methods to prevent the enormous loss of timber by insect injury, in cooperation with the Division of Entomology, of the Pacific coast cedar industry, of forest conditions in critical portions of Missouri, California, Nebraska, Ohio, Michigan, and other States, of the very destructive sand dunes of the Atlantic and Pacific coasts—these are a few of the lines of work we are now following out. Every one of them has a definite bearing in dollars and cents. In particular, the investigation of the effect of forest cover on the run-off of streams, the results of which will be published early in the present year, is likely to be of conspicuous value to the irrigation interests of the West.

The United States is many years behind every one of the great nations of the world in forestry. Russia, of whose civilization, at least in certain respects, we are apt to think without admiration, has a well developed national system of forestry, the revenue from which is approximately $25,000,000 a year. Whether or not the forests of the United States are to be preserved is a matter of enormous economic interest to the nation. So far as I can see, progress or stagnation in that direction depend more than anything else upon the activity of the Bureau of Forestry as you gentlemen in Congress make it possible. The loss from idle forest land, which might be growing trees and is growing nothing at all, while we have no exact figures for its exact amount, is doubtless even greater than the annual loss from forest fires.

Mr. SCOTT. Some time ago there was a forest fire in the northeastern part of Colorado which was confined to a small area, although it continued to burn for a week or more. A forestry man, or at least an agent either of your association or of the Interior Department, who was stationed somewhere near, went and looked at it two or three days after it was there, and offered no suggestions, but went away.

Mr. PINCHOT. Where was that, Mr. Scott?

Mr. SCOTT. That was in northeastern Colorado.

Mr. PINCHOT. That was under the Department of the Interior then.

Mr. SCOTT. It was northwest of Denver.

Mr. PINCHOT. You absolutely can not stop certain fires after they get started. Nothing but a heavy rain will stop them; but I find the relatively imperfect control of the Interior Department in the forest reservations this summer has very greatly protected them, so that almost the whole of the fire loss has been on private land.

Mr. SCOTT. I have a letter from a friend of mine from that section of Colorado who protests very much against the setting apart of any forest reservations. He insists that the moment you set apart a forest reservation, and thereby deny to the citizens all use of it, you excite the animosity, you might say, and the cupidity of settlers, and since they can not use the forest legitimately, they determine to do so illegitimately, and they set fire to it in order to get a range for their cattle. His idea is that one sawmill man is worth more than a whole company of forest rangers in protecting the forests; that the Government would better sell its forests, under the laws which now prevail, to sawmill men to go in and cut what is ready to be cut rather than to attempt to set them apart in great reservations which will be attacked by the settlers who want a range for their cattle.

Mr. PINCHOT. Your friend has fallen into the common mistake about the reserves. If you will give me his name, I would like to write him about it. As a matter of actual fact, under the law the settler has more rights, and it is easier for him to cut timber legitimately in a forest reserve than on unreserved lands. There is a special provision in the reserves for the free use of timber by settlers, and for selling at a reasonable stumpage charge to sawmill men, neither of which exist on unreserved land. Your friend will find, if he looks up the law and the regulations, that he is diametrically wrong about that.

Mr. SCOTT. I will send you his letter.

Mr. PINCHOT. I shall be glad to have it, and will answer it with great pleasure, and send you a copy of my answer. I have just met an exactly similar case in California; and, in general, it is true that false ideas about the forest reserves are unfortunately very widespread. Gentlemen, I do not want to occupy you too long about these matters.

The CHAIRMAN. Go on, we will hear you.

Mr. PINCHOT. To go back a minute, I want to refer to our timber-testing work as an illustration of the way in which the Bureau of Forestry is doing work which is in part private and part Government work. A number of the universities, like Yale, Washington University at St. Louis, the University of California, and others, have built great machines for testing timber.

The CHAIRMAN. The strength of timber?

Mr. PINCHOT. Strength tests for timber and other material. That work is in part private and in part Government work, because it involves tests so long in series, so expensive, and applicable so generally (instead of being specifically applicable to special cases), that it is proper for the Government to make them, just exactly as is done in the case of the Weather Bureau. We have now arranged for cooperation with Yale, the University of California, Washington University, and so on. Whether arrangements have yet been completed with the Massachusetts Institute of Technology I do not know. By these arrangements we get, free of charge, the use of their machines; and we are now making, and we hope to continue to make, an extensive series of tests at a relatively very small cost to the Government. These tests will be the first important tests on American timbers generally accepted by engineers, because we are going to make them on lines submitted to the American Society of Civil Engineers before we start.

Mr. SMITH. You issue Bulletin 46, I think it is, called the Woodman's Guide?

Mr. PINCHOT. The Woodman's Handbook.

Mr. SMITH. I want to say, for your encouragement, that there was never anything of the kind issued as popular in Michigan as that has been. There have been great demands for it. I just made a requisition on you for a hundred yesterday.

Mr. PINCHOT. That is good news.

Mr. SMITH. I never knew a Government publication since I have been in Congress which has been so popular as that.

Mr. PINCHOT. I am delighted to hear it. I know that an edition of 10,000 was exhausted by requests. We do not send them out except to those who ask for them, but the edition was exhausted in thirty days. We have had to have some more printed. I am very much obliged to you for what you say, and very much pleased.

I think the Bureau is getting from institutions and individuals interested in forestry for whom it is doing work their full share of contributions. A large proportion of our appropriation is spent on strictly Government work, and what is being done for private individuals, so far as it is not properly Government work, is being paid for by them. We get without cost results of very great value for which we would have to spend otherwise practically the same amount of money from our appropriation.

The CHAIRMAN. Eliminating the private individuals to a great extent and confining yourself more strictly to Government work, has the demand increased $83,000 over last year?

Mr. PINCHOT. I should say the demand has increased more than $283,000.

The CHAIRMAN. But is it a legitimate demand?

Mr. PINCHOT. Yes, sir.

The CHAIRMAN. Is it not somewhat forced and sentimental, perhaps?

Mr. PINCHOT. It is not in the least forced. For example, take the Indian reservations, the matter that came in last. Timber is being sold from the Indian reservations, and has been for years. The Interior Department has just asked us to go on these reservations when the question of sale comes up, find out what the condition is, and tell them how to cut without absolutely destroying the forests. One of the reports of this work was sent to me in San Francisco, and I read it as I came back. On one of the Indian reservations the forest on a great many thousand acres which had been cut in the past, before this arrangement began, had been so absolutely destroyed, seed trees and everything, that the man who went up there from the Bureau of Forestry was unable to make any suggestion as to what could be done with it.

That area was permanently ruined. By "permanently" I mean for fifty or a hundred years. At the end of that time you would begin to have the little trees come up where they might have started fifty or a hundred years before. The cutting of timber on the Indian reservations is going on very rapidly. If that same kind of destruction is to be stopped wherever that cutting is going on, the Bureau of Forestry must take hold and help to stop it. Otherwise, it will continue.

The CHAIRMAN. Under whose care is it now?

Mr. PINCHOT. The care of the Interior Department. They send to us for the information exactly in the same way as in the case of the military reservations. In addition, the condition of the national forest reserves is very serious.

The CHAIRMAN. In this case does not the Interior Department get some appropriation?

Mr. PINCHOT. It spends that which it gets mainly on forest rangers, who are men without any knowledge of forestry at all.

Mr. SCOTT. What are your foresters doing in the Interior Department?

Mr. PINCHOT. One of the things is this Indian reservation work. Another matter is the preparation of working plans for conserva ive lumbering for the forest reserves. A very large amount of timber can be cut from the reserves now without destruction. All the men, with perhaps two exceptions, now in the Interior Department who have any training in forestry are men from the Bureau of Forestry.

Mr. SCOTT. What are they doing there?

Mr. PINCHOT. By the conditions under which they are working they are practically confined to the control of the reserves for protection and the sale of timber.

Mr. SCOTT. I did not suppose your expert foresters were doing that kind of work. I supposed they were stationed here in Washington and were doing the kind of work you have described.

Mr. PINCHOT. The expert foresters in the Bureau of Forestry lent to the Interior Department are three in number. The one who is in charge of that work came from the Bureau of Forestry, and he is obliged to give all his time to administration. He has been able to do a great deal of good.

Mr. SCOTT Would it not be a good idea for your Bureau to move over into the Interior Department?

Mr. PINCHOT. It would be a good idea for them to move over to us, in accordance with the President's recommendation.

Mr. SCOTT. They are the custodians of the ground on which your timber grows. They have charge of it for sale.

Mr. PINCHOT. Now you put your finger, I think, right on the point.

They have charge of it for disposal. The land office is organized to get rid of the public lands.

Mr. SMITH. They have charge of the title.

Mr. PINCHOT. They have charge of the title, and we are perfectly willing that they should have charge of the title. They ought to have charge of it, but we want to take supervision of the timber.

Mr. SCOTT. I want to get your opinion on the question whether it would not be more logical to transfer your Bureau to the Interior Department rather than to transfer the forest reservations, a part of the public domain, from the Interior Department, which has general charge of the public domain, and put them under the care of your Bureau.

Mr. PINCHOT. I think not, for a number of different reasons. One of them is that this whole question is a question of growth. It is an agricultural question primarily—a question of production from the soil, and not a question of title. The Interior Department is a great legal Department for the handling of legal questions. The Department of Agriculture handles questions of growth. Then, again, the Interior Department is greatly overloaded now, and has shown itself to be very greatly handicapped in a good many directions in the handling of this forest question.

The Bureau of Forestry, if it went over there as a part of the Interior Department, either in the Land Office or otherwise, would be very greatly handicapped as compared with its chance for efficiency in the Department of Agriculture. To make the transfer in that direction would be a step backward instead of a step forward. The Bureau of Forestry can do more work and better work where it is than if it were moved to the Interior Department.

There are many questions which the Bureau of Forestry is compelled to handle which are entirely foreign to the sphere of the Interior Department; for instance, the giving of advice to private owners, which must continue until the forest schools can turn out men able to do it themselves, would be entirely out of place there. Questions such as these of timber tests and of the prevention of damage by the sand dunes of the coast do not belong over there, and so on.

Mr. SCOTT. You are familiar with forest conditions in Colorado?

Mr. PINCHOT. I am somewhat familiar with them.

Mr. SCOTT. What would be your estimate of the length of time required to reforest an area that had been burned over and bring it again to the lumbering stage?

Mr. PINCHOT. It would be fair to say from seventy to a hundred years. That is a rough guess. Of course it would depend on where the area was and what seed trees were left standing.

Mr. SMITH. I want to ask you a question on this matter of transfer. How does Professor or Dr. Roth, from the University of Michigan, now in the Land Office, differ in his duties from a forester in your Department?

Mr. PINCHOT. He is chiefly concerned, where he is, with the actual administration of the reserves—that is, the appointment of rangers, the sale of timber, and to some extent with questions of boundaries. The administrative and legal side of the matter is what he is concerned with. He has no men to do actual foresters' work in the woods, and his surpervisors and rangers are, without exception, men who have no trained knowledge of forestry.

Mr. SMITH. What I am getting at is this: Why do not those rangers more particularly belong in your Department?

Mr. **Pinchot**. They do.

Mr. **Smith**. In a general way, what are their duties?

Mr. **Pinchot**. They are practically range riders. They are police guards. They control the reserve.

Mr. **Smith**. And watch fires?

Mr. **Pinchot**. And watch fires and timber thieves. They are supposed also to keep supervision of the cutting.

Mr. **Smith**. It occurred to me, from the little investigation that I made, that they naturally and logically belong to your Department.

Mr. **Pinchot**. That is the way it struck me. It seems to me to be a pure waste to have this part of the Government's forest work conducted apart from the Government foresters.

Mr. **Smith**. In other words, everything pertaining to growth and vegetation ought to be in your Department, and everything pertaining to title to land ought to be in the Land Department.

Mr. **Pinchot**. Precisely.

Mr. **Scott**. If that is true, ought not the proposed Appalachian Park, which contemplates the acquisition in fee simple of from 2,000,000 to 4,000,000 acres of land, to be put in the hands of the Interior Department? I hardly see the consistency, if you will pardon the interruption for a moment longer. You answered Mr. Smith, I think, very properly that all questions relating to title——

Mr. **Pinchot**. The title to the public lands?

Mr. **Scott**. Ought to be in the Interior Department?

Mr. **Pinchot**. Yes.

Mr. **Scott**. But here is a question which would certainly be a question of title.

Mr. **Pinchot**. Not a question of title to public lands.

Mr. **Scott**. They will be public lands when they are acquired by the Government.

Mr. **Pinchot**. They will be when they are acquired by the Government, but they are not public lands now. One of the reasons why it is better for the Department of Agriculture to do this work is that we are already thoroughly familiar with the problem. We have studied it on the ground. All the information there is in the Government departments about that question is in the Department of Agriculture. None whatever is in the Interior Department.

Mr. **Scott**. What questions except the questions of forestry have been studied in the Department of Agriculture?

Mr. **Pinchot**. All the questions which affect the proposed purchase.

The **Chairman**. You have not gone into the details of title?

Mr. **Pinchot**. Yes; we are already very familiar with the question of titles and prices. We had to become familiar with those matters in order to find out what the land could be bought for and whether title could be given.

The **Chairman**. Was not that work premature? Was it not putting the cart before the horse?

Mr. **Pinchot**. No; because we could not make a recommendation for the tract until we knew it could be purchased.

The **Chairman**. Congress had not called upon you for a recommendation, had it? I do not think the committee ever asked for a report.

Mr. **Pinchot**. Congress made an appropriation in the agricultural bill of not exceeding $5,000 for the examination of those forests, as the result of a request from the Secretary of Agriculture and a committee of the Appalachian Forest Reserve Association for an examination of these same questions; so we went ahead and made it.

Mr. DAHLE. What is the condition of the forests in that range?

Mr. PINCHOT. The forests are being rapidly destroyed there, and as a result they are having very serious floods throughout all the region tributary to the Appalachian range on the east, south, and west.

The CHAIRMAN. Then it comes down to this, Mr. Pinchot, that the primary work of the Bureau of Forestry ought to be the preservation of the Government reserves?

Mr. PINCHOT. Without question.

The CHAIRMAN. And then there is a side work, to disseminate knowledge and information to private owners?

Mr. PINCHOT. Certainly.

The CHAIRMAN. And, where they are willing to pay the expense of it, to give them practical demonstrations.

Mr. PINCHOT. They do not get them from us unless they do pay the expense of it.

The CHAIRMAN. Within those lines I think your work is perfectly legitimate.

Mr. PINCHOT. The question is now, Mr. Chairman, whether or not we are going to have any forests left.

The CHAIRMAN. The Government can not control the individual. In the end he can do as he pleases with the land.

Mr. PINCHOT. Certainly. All you can do is to give him information.

The CHAIRMAN. He can burn his forests up if he wants to; but so far as the Government reserves are concerned, the Government ought to take care of them, but the Government can not make me keep my cattle where I do not want to keep them. They can give me all the information I need as to how to properly keep them. That is all you can do with the forests.

Mr. PINCHOT. That is all, certainly.

The CHAIRMAN. When you come down to the great Government reserve, why have you not money enough to do that work?

Mr. PINCHOT. In the first place we can not eliminate the private work now.

The CHAIRMAN. Why not?

Mr. PINCHOT. Because it can not be done unless we do it, and unless it is done the great bulk of our forests will be destroyed.

The CHAIRMAN. If it is not to be done the Government is not responsible for it, I think. If the individual will not do it, why is the Government responsible for it?

Mr. PINCHOT. The question arises here, what is the object of the Bureau of Forestry? Is it to preserve the forests of this country?

The CHAIRMAN. It is to teach forestry.

Mr. PINCHOT. And what is the object back of that?

The CHAIRMAN. The primary object is to teach forestry, but if people will not be taught, what are you going to do?

Mr. PINCHOT. They are showing every desire to be taught. This is a big country, and we are just beginning to get started. I have been very much gratified by the attitude of the lumbermen of the country toward the Bureau of Forestry.

The CHAIRMAN. I have no doubt it will come in time.

Mr. PINCHOT. The trouble is we are confronted by a very critical situation. The timber is going more and more rapidly. The loss from forest fires alone, in this country, while we do not know the figures exactly, is probably over $50,000,000 a year.

The CHAIRMAN. I do not see how you are going to stop it. You can not have a force of men there to put out a fire.

Mr. PINCHOT. We can only stop it by public opinion.

The CHAIRMAN. You said last year, as I remember, that you can rouse the people to the danger of fires.

Mr. PINCHOT. That is what we are trying to do.

The CHAIRMAN. There is a limit to that. You can only go about so far in arousing people.

Mr. SCOTT. It seems to me the people are sufficiently aroused, as far as that is concerned. Every State has the most severe laws for the punishment of persons starting fires, regulating camp fires, and all that sort of thing.

Mr. PINCHOT. Many of them have.

Mr. SCOTT. And yet fires occur.

Mr. PINCHOT. None of them are enforced.

Mr. DAHLE. Most of them are dead letters.

Mr. PINCHOT. Not one of them is actually enforced, to my knowledge.

Mr. SCOTT. Of course the majority of the fires are started by accidents, and by men who regret it as much as if they had burned a house.

Mr. PINCHOT. No, I do not think they do regret it in that way. A great majority of the fires are started by carelessness.

The CHAIRMAN. I think they are set by hunters and others.

Mr. PINCHOT. If a man wants a fire to boil his coffee in the morning, he often makes it against a great half-rotten log instead of out in the middle of the trail, and then goes off and leaves it, and a forest fire is the result. I have myself put out a great many fires of that character.

The CHAIRMAN. It is caused by thoughtlessness.

Mr. PINCHOT. Mr. Wadsworth has said a number of times that his general attitude about this matter is that we should not go too fast, but that the Bureau of Forestry should go as fast as it safely can to meet this enormous demand. The demand each year is outstripping further and further the amount of work we can possibly do. We have requests for working plans for 60,000,000 acres of Government lands at least, and the other work is spreading very rapidly among people who want to give us money, among lumber companies, and among the States. What makes me confident that we are not going too fast is that there is an enormous and growing demand for help in forest protection in this country.

The CHAIRMAN. My idea is that the first work of the Bureau of Forestry is to take care of the Government reserves. Then you can tell any private individuals how to take care of their forests, and if they do not do it they can blame themselves. The result will be that gradually nine-tenths or perhaps all of them will abide by the methods of the Department.

Mr. PINCHOT. Eventually.

The CHAIRMAN. Changes come slowly in a country like this. We are used to doing pretty much as we please; but with the exhaustion of our timber supply, particularly, they are going to be more cautious and careful. The dissemination of that knowledge does not look to me to be an expensive matter.

Mr. PINCHOT. The trouble is you can not merely write about it. That was tried for years and failed completely. You have got to go on the ground and show them how to do it.

The CHAIRMAN. Then I think the private owner should pay the expense.

Mr. PINCHOT. He does, except the salaries of the men.

The CHAIRMAN. You can make the charge so high that the salary will be included, can you not?

Mr. **Pinchot.** No; we turn into every private owner a statement of account, based on the Department fiscal regulations.

Mr. **Scott.** What does the Department pay for?

Mr. **Pinchot.** It pays nothing but the salaries.

The **Chairman.** The individual pays only the traveling expenses and board and lodging.

Mr. **Pinchot.** We can not make him pay the other expenses.

The **Chairman.** You can in an indirect way, can you not?

Mr. **Pinchot.** It seems to be difficult. We have to tell him exactly what his money is spent for.

The **Chairman.** We have had under discussion here for the last day or two the matter of the inspection of nursery stock. The bill provides that the nurseryman must pay all costs, and all costs means a proportion of the per diem of the inspector. The bill can not pass in any other way.

Mr. **Pinchot.** We are in a very difficult situation in forestry because we are dreadfully short of men. The schools are only just beginning to turn them out. If we let our men go, private owners will get them away from us.

The **Chairman.** Suppose they do; you are doing good to the country.

Mr. **Pinchot.** Then we are absolutely crippled as to our government work.

The **Chairman.** You are temporarily crippled, but still you are doing good to the country.

Mr. **Pinchot.** Not really so much good. His work becomes local instead of general; its results are not published and consequently are not known, and the higher salary he gets results in direct loss to the general progress in forestry.

The **Chairman.** That is the objection the Secretary raises all the time—about salaries. These people are taken away at higher salaries. That is doing good to the country all the time. Let them take your men away from you, if they want to, at larger salaries. It may cripple you for awhile, but, on the other hand, you are accomplishing just what you set out to accomplish.

Mr. **Pinchot.** Of course we want to have our men spread out gradually, but not to have them go into less influential work.

The **Chairman.** These men leave you and go out and do the work in a broader way than you can do it.

Mr. **Pinchot.** Far from it. As soon as a man goes into a particular locality, it becomes a neighborhood question.

Mr. **Smith.** Mr. Chairman, permit me to suggest, in the case you put, that the particular neighborhood has obtained a good man from the Government Department; but that only helps one neighborhood, not the country generally.

The **Chairman.** How can he help it except by neighborhood.

Mr. **Smith.** While he is employed in the Department he is in the general field for the general good of the great public, and he is taken from the great public and put into the neighborhood.

Mr. **Pinchot.** Let me make this explanation, Mr. Chairman. All the work a man in the Bureau of Forestry does is put into a bulletin and disseminated in 10,000 or 20,000 copies. It goes all over the country. His information is spread everywhere. The private individual's work never goes out of the one place.

The **Chairman.** But his neighbor knows what he is doing. For instance, I am a grower of cattle. I learn that my neighbor's cattle are doing better than mine, and I find out what he is doing. My next neighbor learns that my cattle are doing better than his, and he finds out what is the reason for it. So it goes in the Bureau of Forestry. A man leaves the Department and is employed by a big lumber company. The next man finds out that that company is getting more out of its forest than he is, and he learns the reason for it; and so it goes. You do not lose that man to the country. You may lose him in your little Bureau, but not to the country.

Mr. DAHLE. If a man quits the Government service and goes into another job entirely, then it would seem to me the country loses the good of that man.

Mr. PINCHOT. I would like to ask Mr. Smith a question right in this line. What would be the relative value to the country of a lumber company's doing the work that is published in the Woodman's Handbook, as compared with our spreading it over the country?

Mr. SMITH. It is just the difference between the neighborhood and the country.

The CHAIRMAN. But you have to take up the country by neighborhoods. You can not pretend to teach every individual lumberman in the country. People have to learn by the experience of their neighbors.

Mr. SMITH. Taking the Chairman's illustration, all the neighbors around his farm have become inoculated with his notion of raising cattle, and have profited by it; and every pebble that drops into the sea makes a wave that goes on forever, but when that wave gets up to Michigan it is so imperceptible that we do not feel it.

The CHAIRMAN. I do not think information of that sort would spread all over the country, but my idea is that where a man leaves the Department and takes employment at a higher salary with a private enterprise, it is a credit to the Department, and you ought not to begrudge losing him.

Mr. PINCHOT. Let me take it up in that point of view. If it is a good thing for us to train men for the country at large——

The CHAIRMAN. You give them a sort of post-graduate course.

Mr. PINCHOT. We give them a sort of post-graduate course. But then we have to keep others coming on, this forest work now being in its inception.

The CHAIRMAN. You know perfectly well that these young men in your Bureau can not get very prompt promotion.

Mr. PINCHOT. No, sir; many times they do not; but we have to keep them coming on.

The CHAIRMAN. I agree with you about that.

Mr. PINCHOT. If you check, in the public opinion, the growth of the Bureau of Forestry, which the young men who are now taking up forestry believe is going to grow, and which certainly is going to grow, you check the possibility of our getting the right grade of men to go into forest work. One of the things I have been most anxious for ever since I came into the Department of Agriculture is to get men of a higher grade to take up this work, so as to give it high standing. We are doing that now. If you check the work of the Bureau, and check, consequently, the idea of Government interest in forestry, you take away the spring from which we are getting our young men. This next year we shall have graduated from the Yale forest school about twenty men, trained technically in forestry, two from Cornell, and I do not know how many from Biltmore. There may be three or four and there may not be any. The estimates for this year provide simply for what I knew I had men in sight to do, and men of the right kind.

The standard of the Bureau has risen every year for the last four years. Our men are doing better work now, and it is a great deal harder to get into the Bureau now than it was before. I am keenly anxious not to have this education of young men in forestry checked in any way.

The CHAIRMAN. Is their employment limited to the Government service?

Mr. PINCHOT. There is not a tenth part of one per cent of the educated foresters in this country that are absolutely needed for the good of the forests at this minute.

The CHAIRMAN. How long is the course at Yale?

Mr. PINCHOT. Two years post graduate at Yale, four years under graduate at Cornell, and one year at Biltmore.

Mr. SCOTT. Suppose this increase you ask for were not granted. That would mean, I suppose, that you would not be able to employ any additional men?

Mr. PINCHOT. Yes.

Mr. SCOTT. If the schools turn out these trained foresters equipped to take up this work, and you are not able to employ them, would not individual owners who would otherwise come to you for expert assistants go to these graduating colleges in the schools?

Mr. PINCHOT. Mr. Harvey can tell you about that better than I can. In my judgment the demand from private owners for individual foresters is not very great. It is a totally different thing for a man to give us $500 for a working plan, and get with it an official guaranty of its practicability, and for him to pay $2,500 a year for a young untried man all his own. We can reach a great number of people in that way who do not actually need foresters. In my judgement, the demand is not yet adequate.

Mr. SCOTT. When you send a man in response to individual request, does that man publish the result of his work?

Mr. PINCHOT. It is part of the consideration that we have a right to publish the results of the work, and we have done so already on a considerable scale.

The CHAIRMAN. It is published in bulletins, and one thing and another?

Mr. PINCHOT. Yes.

The CHAIRMAN. About how much have you received from private parties for work done?

Mr. PINCHOT. It is about $20,000 in the last year.

The CHAIRMAN. Do you turn that into your general fund?

Mr. PINCHOT. No, sir. As I said, we simply render an account to each man, based on our fiscal regulations. A man goes out and pays his expenses from this money.

Mr. SCOTT. Does that go into the United States Treasury?

Mr. PINCHOT. No; it is deposited by the private owner with a bonded officer in the Bureau of Forestry. Every man who has any of this money is bonded to all he has, and he renders an account.

Mr. SCOTT. What becomes of the $20,000 which you collect from private owners?

Mr. PINCHOT. It goes to pay the expenses; board and lodging and all the rest of it.

The ratio of increase asked for in the Bureau of Forestry this year is less than half that of any previous year. The secretary said he did not want any large estimate this year, and so did Mr. Wadsworth. It is not only less than it has been in any previous year, but it is the very least with which I thought, at the time, we could meet the legitimate demands. For example, we have about 5,000,000 acres of private forests for which we are asked to furnish help, and we can not do it, although they will pay the expenses.

These people have got sick and tired of waiting. We have put them off year after year. We have neither men nor money enough. A good many of them are losing interest in the matter. It means the loss of just that much introduction of forestry in different neighborhoods over the country.

The CHAIRMAN. How many foresters have you now?

Mr. PINCHOT. Mr. Price says there are 263.

Mr. SMITH. For my own information, I desire to know this. You wrote the Primer of Forestry, as I recollect it?

Mr. PINCHOT. Yes.

Mr. SMITH. Was that done under your general duties in your Department, or for your private enterprise?

Mr. PINCHOT. It was done before I came into the Department.

Mr. SMITH. But it has been distributed as a public document?

Mr. PINCHOT. I simply turned it over to the Department; yes.

Mr. SMITH. You turned over to the Department for public distribution your own private property?

Mr. PINCHOT. I did.

Mr. SMITH. And are you able to estimate or to state the good that came from the circulation of that publication?

Mr. PINCHOT. Well, there have been two Congressional reprints. It has been more largely in demand, I believe, than any other publication of the Department of Agriculture except the Horse book.

Mr. SMITH. That is what I wanted to show. I knew you were so modest you would not have mentioned it unless I suggested it.

Mr. PINCHOT. You are very good.

Mr. WRIGHT. Would there have been any possibility of your saving that large tract in the State of Washington? Do you exercise police supervision?

Mr. PINCHOT. No; but we could have saved that tract. We will suppose there are ten owners who control certain timber lands of the Pacific coast. (These timber lands are rapidly passing into private hands.) Suppose we were working with the Wejerhauser people out there, as we should doubtless have been if we had men enough to go round. They would have been looking at their forests with the idea of a second crop, which now they are not doing. They would consequently have been watching for fires and would have had men there to look after them; and if the Bureau of Forestry had been in full cooperation with all the owners of the burned timber lands, I can say with perfect confidence those fires would not have occurred.

Mr. HAUGEN. You referred a moment ago to the forest which it is proposed to map out in the Appalachian Mountains, and you said you had some knowledge of the cost and title of the land. How much of the land is available for this park?

Mr. PINCHOT. We are asking for 4,000,000 acres.

Mr. HAUGEN. How much will it cost?

Mr. PINCHOT. It will cost, we estimate, a little less than $2.50 an acre, on the average.

Mr. HAUGEN. How much do you propose to buy under the bill reported by this committee?

Mr. PINCHOT. The bill provides for an appropriation of $2,000,000, to be available until June 30, 1906, and authorizes the Secretary of Agriculture, on the whole, to make contracts to the extent of $10,000,000.

The loss from floods, in one year, in that same country was over $18,000,000.

Mr. HAUGEN. Do I understand you contemplate the purchase of 5,000,000 acres of forest reserves outside of this?

Mr. PINCHOT. Oh, no; there is no other purchase contemplated that I know of. These are lands owned by private individuals or companies, who want our help in handling them conservatively.

Mr. HAUGEN. Who owns these lands?

Mr. PINCHOT. They are owned in nearly every State in the Union by different individuals and different companies, large and small.

Mr. HAUGEN. You have no estimate as to the number of holders?

Mr. PINCHOT. I could not give you the number now. I could do it at the Bureau.

Mr. HAUGEN. What is your estimate?

Mr. PINCHOT. Perhaps fifty; or more than that.

Mr. SCOTT. Mr. Chairman, as Mr. Pinchot has just returned from the Philippines, I suggest that we would be interested in hearing him talk about forest conditions there.

The CHAIRMAN. Certainly.

Mr. PINCHOT. I shall be glad to give the committee any information I can about the Philippine forests. There are enormous quantities of superb timber in the Philippines. I should say a good deal more than half of the total area of the islands, which is 117,000 square miles, I think, is densely timbered. Nearly the whole island of Mindanao is covered with heavy timber. The same is true of Paragua, and a great deal of Luzon—I do not know what per cent—is likewise heavily timbered.

Samar is almost entirely timbered, and so with a great number of the small islands. The timber in most cases grows right down to the water's edge, and the best of it will be easily taken out as soon as proper appliances are brought to bear.

Mr. SCOTT. What varieties prevail? I mean of valuable woods.

Mr. PINCHOT. I can give you the native names.

Mr. SCOTT. Is there a good deal of mahogany there?

Mr. PINCHOT. There is a great deal of narra, which is mahogany; yes; also Ipil, Molane, Tindalo, Dungun, etc.

Mr. HAUGEN. Is there much ebony?

Mr. PINCHOT. There is a good deal of ebony; yes.

Mr. SCOTT. Those you have mentioned are valuable commercial timbers, are they?

Mr. PINCHOT. Very valuable commercial timbers.

Mr. SCOTT. Can you name any temperate-zone timbers that can be compared with them?

Mr. PINCHOT. No; we have none. The best Philippine timbers are very dense. Nearly all of them sink in water when they are absolutely dry. They are very hard. They are cabinet woods. I have seen a table nearly as long as this, 1 or 2 feet wider, made of one piece of narra. They have wonderful pieces of wood there. A good deal of this timber is from 150 to 175 feet high, and in a dense forest it will run from 90 to 100 feet to the first limb.

Mr. SCOTT. They are deciduous trees mostly, are they not?

Mr. PINCHOT. No; they are broad-leaf trees, but evergreen. The forests are immensely dense, so that a great deal of it you can not get through without a bolo. You have to cut your way through the vines and creepers, and it is very hard for travelers. The topography is generally rough, so as to make it extremely difficult to log, and the logging appliances are of the most primitive possible kind. Of the carabao, which is the principal beast of burden, about 90 per cent are dead, killed by the rinderpest. I have seen them hauling by hand with ropes immense logs 200 feet long and 30 feet through and heavier than the heaviest hickory we have. Not only the logging methods are poor, but almost all the sawmills I saw in the island are turning out wretched work.

The CHAIRMAN. How many sawmills are in operation there?

Mr. PINCHOT. To make a pure guess, not over a dozen of any size.

Mr. SCOTT. Have any lumbering companies gone in there since the occupation?

Mr. PINCHOT. A few, but the amount they have cut so far has been comparatively small. Labor is very scarce at this time, and I do not believe myself that any very great development of the Philippine forests is coming within two or three years. That it is ultimately coming, and that the timber will be exceedingly valuable to the Government, I have not the slightest doubt.

Mr. SCOTT. Where do you expect to find a market?

Mr. PINCHOT. In China, in the islands themselves, and over here. The Pullman people have expressed themselves in the most complimentary way about the sample logs that have been sent them, and I believe that as cabinet woods they will have a very large use.

Mr. HAUGEN. Are they exporting their lumber now?

Mr. PINCHOT. No; they are not cutting anything like as much as they are using. There is a very large import now of California red wood and red fir, incorrectly called Oregon pine.

Mr. HAUGEN. Are not these timbers hard woods?

Mr. PINCHOT. Chiefly; although there is some pine in the islands and there are a number of the less known timbers that are soft. There is one tree called lauan, out of which I hope there is going to be at the St. Louis Exposition a canoe in one piece of wood 90 feet long.

Mr. GRAFF. Why is it they can import into the Philippine Islands this California wood as against the timbers of the island?

Mr. PINCHOT. Because the cost of logging and the cost of manufacturing is high, and exactly the opposite obtains on the Pacific coast. The cost of shipping across is less than the difference. I know of only one mill that is selling any native construction timber at the same price as Oregon and California timber.

Mr. GRAFF. The transportation from the forests where the wood is cut to the place of its use is a very large factor?

Mr. PINCHOT. Yes.

Mr. GRAFF. I believe that they have but one railroad in the island, have they not?

Mr. PINCHOT. That is all, and the timber is all cut tributary to that. Logging has to be done generally by carabao.

Mr. GRAFF. Were you on any of the islands except the island of Luzon?

Mr. PINCHOT. I was in every one of the large islands and many of the small ones.

Mr. GRAFF. Were you on the island of Cebu?

Mr. PINCHOT. Yes.

Mr. GRAFF. Were you at Cebu?

Mr. PINCHOT. No; I kept away from large cities as far as I could, to get into the woods. I landed on the northern part of Cebu, but there is very little timber on Cebu anyway.

Mr. GRAFF. Is it a flat country or a mountain country?

Mr. **Pinchot**. It is fairly flat. It has one range down the middle of it, as most of the large islands have, but it is a very highly cultivated region. It is one of the best islands in that way. I have notes, I think, on the timber conditions of over 200 of the islands, from personal observation.

Mr. **Lamb**. What is the estimate per acre of the timber of the islands?

Mr. **Pinchot**. They figure it all the way from 5,000 feet to 50,000 feet, and I think a good deal of it will run from 25,000 to 30,000.

Mr. **Lamb**. It must stand very thick then.

Mr. **Pinchot**. It is so thick the vines often tie it together so that you can not get through.

Mr. **Graff**. I have heard the forests in the Philippine Islands are not composed, for instance, largely of one species of tree.

Mr. **Pinchot**. They are not.

Mr. **Graff**. But they are composed of various kinds and that that detracts from the value of these woodlands.

Mr. **Pinchot**. There is no doubt about that. There is only one large body of one kind of tree that I know of, and that is pine, up in Benguet Province.

Mr. **Graff**. What is the reason for that? It is true that in this country you will usually find in the forest trees of perhaps two or three varieties only, and that is not true in the Philippines.

Mr. **Pinchot**. Where you find great bodies of one kind of timber in this country it is almost always pines or spruces or other coniferous trees that are in large bodies. There are practically no large bodies of broad-leaf trees in this country, and all these forests, except in Benguet, are of broad-leaf trees in the Philippines.

Mr. **Graff**. Broad-leaf trees do not include maples?

Mr. **Pinchot**. Yes; but where you find maple forests you find beech and birch scattered in with it in this country.

Mr. **Lamb**. There are none of our hard woods in that country?

Mr. **Pinchot**. There are none.

Mr. **Haugen**. Did you find any birch or maple?

Mr. **Pinchot**. From the time I landed until I came away I never saw a tree that I knew by sight before I reached the islands.

Mr. **Graff**. What kind of labor do they employ for working in the woods?

Mr. **Pinchot**. Philippine labor entirely.

Mr. **Graff**. Do the Chinese do any of that kind of work?

Mr. **Pinchot**. No; the Chinese are practically all merchants, or else they are coolies in Manila.

Mr. **Haugen**. How much do they pay there for labor?

Mr. **Pinchot**. I believe the laborer gets 50 cents to 75 cents Mexican a day.

Mr. **Haugen** In silver?

Mr. **Pinchot**. In silver; and then in Manila they get a great deal more—up to a dollar in gold in some cases.

Mr. **Graff**. Is it not true always that the great factor about the handling of trees and making them into lumber is the question of moving them and taking them to market.

Mr. **Pinchot**. Precisely; and the cost of that is very high at present in the Philippines.

Mr. **Haugen**. Is the expense of transportation much greater from the Philippines than it would be from other countries nearby producing the same kind of timber—old Mexico, for instance?

Mr. PINCHOT. No; I do not think it is. You can put the timber on board a schooner, and after you have got it once loaded the cost of getting it to our coast in a sailing ship is not very large. It is a very cheap method of transportation, and I judge there is a good deal finer class of timber in the Philippines than in old Mexico.

Mr. WRIGHT. I understand the transportation is confined to the railroads; they can not run the logs in the streams at all.

Mr. PINCHOT. They can; some kinds.

Mr. WRIGHT. How about the highways?

Mr. PINCHOT. There are no highways.

Mr. WRIGHT. Have they not commenced to build roads?

Mr. PINCHOT. They may have begun; but you can fairly say there are no highways; there are only trails.

Mr. SCOTT. Did you penetrate the interior?

Mr. PINCHOT. Yes.

Mr. SCOTT. How did you get in? Did you have an escort?

Mr. PINCHOT. I got in on horseback and on foot. I only had one escort. The one road I know in the islands not near a city is from Malabang to Camp Vicars, on Lake Tanao.

Mr. SCOTT. That is in Luzon, is it?

Mr. PINCHOT. That is in Mindanao, where they have been fighting the Moros.

Mr. GRAFF. Is there not a species of people there who inhabit the forest?

Mr. PINCHOT. Wild people, yes; the Negritos.

Mr. LAMB. You did not go yourself into the groves where they live, did you?

Mr. PINCHOT. Yes.

The CHAIRMAN. You say there are no roads there?

Mr. PINCHOT. None.

Mr. SCOTT. You found no difficulty in your travels from one place to another, except the difficulties presented by the physical conditions?

Mr. PINCHOT. None. Governor Taft was kind enough to lend me a gunboat, which had been assigned to him by the Navy. We traveled about 3,000 miles in her, and that enabled me to make a better trip than I could possibly have made otherwise.

Mr. SCOTT. I meant, of course, when you got on shore. You found the conditions quiet?

Mr. PINCHOT. Perfectly. We went armed because of the ladrones, but we never had occasion to use any arms. Once or twice the situation was reversed and the people left when they saw us coming. Otherwise there was no difficulty.

Mr. GRAFF. Did that make you angry?

Mr. PINCHOT. Not a bit. There was no trouble whatever, and especially there was no trouble in the Moro country, where I had supposed, before I went out, that there was a frightful problem offered to our troops, and that it was going to be the hardest kind of hard work to fight these people.

Mr. GRAFF. Do these wild people, as you term them, wear anything?

Mr. PINCHOT. I did not see any of them, but I understand they wear very little.

Mr. DAHLE. Is there a large percentage of those people there?

Mr. PINCHOT. No; very few. They are little people, about 4 feet high, and they live entirely by hunting.

Mr. DAHLE. When you speak of living by hunting, do you mean that they hunt with bows and arrows?

Mr. **Pinchot**. They hunt with bows and arrows.

Mr. **Dahle**. Of the other people, are there many distinct races?

Mr. **Pinchot**. There are something like eighty distinct tribes. We constantly found new dialects. I never had this to happen to me, but Captain Ahern says he has had to use four interpreters before he could talk to a man. He has had to have what was said translated four times to get to him.

The **Chairman**. As an American citizen, would you sell your birthright in the Philippines?

Mr. **Pinchot**. I would not. Now, that I have been there, I am thoroughly glad we took them. It is a superb piece of property and enormously rich.

Mr. **Dahle**. Are the people there rich?

Mr. **Pinchot**. They are richer than when we first came there. Their standard of life has been raised decidedly since we arrived.

Mr. **Wright**. Is that an advantage to us?

Mr. **Pinchot**. Yes.

Mr. **Wright**. To us?

Mr. **Pinchot**. Yes; for example, one of the lumber companies sent some sacks of flour to their camp. The people had never eaten anything but rice, and the company had to give the flour away. Pretty soon the Filipinos got the taste for flour and now there is a large demand for it in that camp.

The **Chairman**. Did they give it away free?

Mr. **Pinchot**. They had to give it away at first.

The **Chairman**. Is it given away free now?

Mr. **Pinchot**. No, sir.

Mr. **Graff**. I was told by an army officer a few days ago that when some of these Filipinos were imprisoned and were being allowed the ordinary army rations they did not get along very well, not because the army ration was not large, because it was a good deal more than they were accustomed to eating, but because they were unaccustomed to that sort of food, and they did not prosper until finally they changed the method and issued to them a food to which they were accustomed.

Mr. **Pinchot**. Fish and rice?

Mr. **Graff**. Yes; I want to ask about the use of these various timbers by the people of the island. Do they use for the building of their dwellings and other buildings anything except the bamboo?

Mr. **Pinchot**. Yes. What is called the nipa and bamboo hut is simply used by the lower classes of the natives; but in all towns of any size the good houses are built of timber.

Mr. **Graff**. All the pictures of their houses which I have ever seen show them with an upper story inhabited by the family and then the lower story would be used for a stable.

Mr. **Pinchot**. Inhabited by the pig.

Mr. **Graff**. Is that the ordinary method?

Mr. **Pinchot**. That is the regular method. The ordinary Filipino has a little shack raised 3 or 4 feet from the ground. He has underneath it two or three pigs tied by the hind leg, inside it three or four game cocks similarly tied, and he pours down all the refuse from his house through the floor to make a congenial habitation for the pig.

Mr. **Graff**. Is that the same method that is adopted by the better classes?

Mr. **Pinchot**. No, sir; it is absolutely different.

Mr. **Graff**. Do they have houses built after the fashion of people in the United States?

Mr. PINCHOT. Yes; they have very good houses, very well built, and you are particularly struck when you go in there by the superb timber that has been used in the floors.

Mr. GRAFF. What do they use in the floor?

Mr. PINCHOT. Narra is one of the favorite timbers. It is a sort of mahogany. I have seen floor boards over 30 feet long.

Mr. GRAFF. I was told by a gentleman who was a surgeon there and who recently returned to the United States that he had an immense piece of mahogany, a circular piece, suitable for a large dining table. I will not venture on exactly the diameter, but it was something exceedingly large. He said he purchased it for a very small sum. It seems to me it was something like 18 feet across.

Mr. PINCHOT. I never saw any so big. Those great pieces, however, are not cut out of the tree itself, but out of huge buttresses that spread out from the tree like wings.

The CHAIRMAN. At the foot of the tree?

Mr. PINCHOT. At the foot of the tree. They grow right out from the tree, and the table would be cut from this [illustrating].

Mr. GRAFF. Are they cross sections?

Mr. PINCHOT. No; they are just buttresses that grow out of the tree. They make their cart wheels from them also.

Mr. SMITH. A buttress like the root extending above the soil?

Mr. PINCHOT. Exactly; they are practically run up from the roots. Some of them run up 15 or 20 feet on the tree and 10 feet out from it.

The subcommittee, at 12.30 p. m., adjourned.

SUBCOMMITTEE ON APPROPRIATIONS.

COMMITTEE ON AGRICULTURE,
HOUSE OF REPRESENTATIVES,
Washington, D. C., January 8, 1903.

The subcommittee met at 2 o'clock p. m., Hon. J. W. Wadsworth in the chair.

STATEMENT OF WILLIAM R. MERRIAM, DIRECTOR OF THE CENSUS.

The CHAIRMAN. Mr. Merriam, we have asked you to come before us on this account: There has been some discussion among the members here about the duplication of work in the several departments, and particularly the duplication of statistics. We find there is a Bureau of Statistics in the Treasury Department, another in the Department of Agriculture, and the Government has now established a permanent bureau, which is, strictly speaking, a bureau of statistics. We want to talk to you and discuss the feasibility of transferring to the Census Bureau the division of statistics of the Agricultural Department, to see whether we could do it with a betterment of the service and a betterment of the lowering of the cost of it. I think you know the situation just about as well as anybody, and we should like you to go on and speak of it in your own way.

Mr. MERRIAM. I will outline to you briefly my views on the subject. The Census Bureau has prepared agricultural statistics in the decennial years under general acts. It always has done so and probably always will. That information is gathered by the enumerators; and of course is the foundation for all subsequent statistical work, so far as it relates to agriculture, excepting certain inquiries which are made by the Agricultural Department and also by the Census Bureau. The Census Bureau has made no special inquiries concerning agricultural work except in the line of cotton production.

Under the act creating the permanent Census Bureau, the Director of the Census was instructed to gather certain returns from the cotton States regarding the amount of cotton ginned with a view of later on giving the public the correct, so far as they could be correct, statistics. All statistics are always subject to error and we started in on that inquiry. The Division of Statistics of the Agricultural Department is doing practically the same work, but they are doing it on entirely different lines. We trust entirely to the ginners. We have organized every county in the Southern States, in the cotton-growing States, and have a special agent in each one of them, involving some 640 agents. Each agent has charge of a county, and we have a list of the gins in every county, because we have made this inquiry two or three times.

There are about 32,000 gins in the United States, not all in active operation, but practically 30,000 of them are. On certain fixed days these agents, or if it is a county where there are a good many gins they are allowed to secure help, hand their reports to the county agents and he sends them into this office and then they are tabulated, the theory being that in the coming years, which will increase the number of reports each year, we can perhaps give them every week, certainly every month, approximately correct figures. Those figures are based on facts. There is very little estimating done. We ask the men who run the gins and the agents to make an estimate of the cotton remaining in the hands of the farmers, so far as they can do so; but we do not assume any responsibility for them at all. We simply state the facts and everybody can draw their own conclusions.

We have just finished the second inquiry, showing that, according to the returns and the estimates of these gentlemen, 90 per cent of the cotton crop has now passed through the gins. Now we are to be instructed, if the resolution passes which is now before the Census Committee, to have these same agents make an estimate of acres planted to cotton in the early spring months. We are also to be instructed to ascertain the number of bales used by textile institutions and the number shipped abroad, the theory being that we shall in this way ascertain not only the amount of cotton raised each year, but the amount left over each year, which always has been more or less a question of doubt.

Once getting a starting point on the 1st of September with all the cotton used and all the cotton shipped, we then start with a certain amount, and then, adding to it, we can ascertain very closely the number of bales carried over each year.

It is not proposed that we shall make any crop estimate beyond the one in April. That is an absolute duplication of the work done in the Agricultural Department. Every inquiry we have made so far has cost a little over $17,500. It will cost $450,000 to make a weekly inquiry.

The CHAIRMAN. Weekly as to all the crops?

Mr. MERRIAM. Just the cotton crop. The cotton crop is the only one that is susceptible of very close estimate. You can reach almost all the bales of cotton raised, by careful arrangements on the lines I have indicated; but it is not possible to do the same thing with wheat or corn.

Mr. SCOTT. You do not believe then, General, that you could, with the present organization of your Bureau, do the work which the Division of Statistics in the Agricultural Department is doing in the matter of forecasting or estimating the wheat and corn and oat crop?

Mr. MERRIAM. Oh, yes; I could do it under their same general plan as well as they do and better perhaps in some ways, because we have the machinery for doing this work. Our office is organized with a number of statisticians who do nothing else but work on these particular lines. The general expense of the office goes on. Our chief statistican is paid by the year, you know, and it would be a question of organization. The Department of Agriculture does not pay anything for its information except where it sends out special agents. In the cotton-growing districts special agents could gather many facts at the same time they are securing the cotton-crop statistics.

Mr. SCOTT. If a change were made, would you recommend that the volunteer reporters that the Agricultural Department now depends upon for those estimates largely out in the field, scattered over the country, should simply be directed to report to you instead of to them?

Mr. MERRIAM. I would say offhand yes, because I have not thought out what machinery would be necessary to gather these statistics, which are really intelligent estimates; that is all.

Mr. SCOTT. That is all they pretend to be.

Mr. MERRIAM. It would not be possible to take a census of the agricultural products of this country, with the exception of cotton, without taking a census by enumerators.

That would cost $2,000,000, and it would not be reasonable to expect it. So that the estimates which are now made in the way of forecastings there is a demand for and probably always will be. Of course the advantage our office would have is that we have to keep a certain number of statisticians and people who are trained to that sort of work to look after the census that comes every ten years, and it would be well to employ them in the meantime on this particular line of work. The great difficulty is we do not agree in our results with the Agricultural Department when we come to the decennial census.

The CHAIRMAN. You state that the cost would be $450,000 for a weekly estimate?

Mr. MERRIAM. Yes, for a weekly estimate.

The CHAIRMAN. Do you mean $450,000 in excess of your present appropriation?

Mr. MERRIAM. No; it would cost $450,000 to do the work.

The CHAIRMAN. How much additional appropriation would you need?

Mr. MERRIAM. I could not tell you, because we carried over enough money from our appropriation last year, and are running on that; and in making the estimate for this year I think I asked for $150,000 for general field work, and I should have to have it increased practically $450,000 to do that work, as some of the Southern members would like to have it done every week. It was intended in the act that we should do it each week, but we were not prepared at that time to undertake it. Now we are ready to take it up and go on with it.

The CHAIRMAN. It would take additional cost to that to make estimates of the other crops?

Mr. MERRIAM. Yes; although I understand the Agricultural Department does not pay out very much money in the field.

The CHAIRMAN. No; very little.

Mr. MERRIAM. We have men in the field all the time for other branches of work. We have 100 now in the field doing other statistical work, traveling over the country and collecting other statistics. Of course there could be a great combination or consolidation of that work. There would be naturally, you know.

Mr. WILLIAMS. Director, do you make an effort to get at what is called the city crop of cotton?

Mr. MERRIAM. What crop?

Mr. WILLIAMS. The city crop. The commission merchant or factor takes a certain amount of cotton from each bale. Then when the buyer buys that cotton he samples it again, and the planter is paid for what is left. New Orleans, for example, turned out about 100,000 bales of city crop, they called it; that is, samples rebaled. Then the cotton-oil mills before they grind the seed or before they complete it relint it, as they call it. They have a gin that will take off what the common gin will leave, and I saw the statement made in the newspapers—I do not know how true it is—that one of the main causes of difference between your Department and the Agricultural Department in your reports was that the Agricultural Department did account for this city crop and relinted crop, as it is called, and the Census Bureau did not.

Mr. MERRIAM. How could they do that? Under what process? Because they have hardly a paid agent.

Mr. WILLIAMS. No; they get reports from the oil mills. Every oil mill in the South sells a very considerable amount of cotton.

Mr. MERRIAM. Under the resolution that has just been sent through the House to the committee, I think it is provided that we shall get information from the cotton-seed oil mills, too. I think we would reach it in that way.

Mr. WILLIAMS. Do you get returns from the cotton factors?

Mr. MERRIAM. No; we only get returns from the gins.

Mr. WILLIAMS. The crop of New Orleans in one year, 1878, a very large crop year, from samples rebaled in the New Orleans market, approached 100,000 bales.

Mr. MERRIAM. Is it possible?

Mr. WILLIAMS. For samples, as it were, taken out.

Mr. MERRIAM. Does not the farmer get paid for this at the time it is ginned? When it is ginned he must get the amount of cotton he is entitled to.

Mr. WILLIAMS. No; they sample his cotton and afterwards they weigh it and pay him for the weight.

Mr. MERRIAM. Does he not sell it at the station where he lives?

Mr. WILLIAMS. After he is through with his year's work, the cotton buyer and the factor, each one of them, gets his sample. The cotton factor takes his sample out and puts it on his table, with the mark of each bale upon it, trying to classify them as best he can. Then when the buyer comes he takes a new sample out of the bale and tests the sample that he bought by with the sample that he takes from the bale and rejects it if it does not come up to the sample; and these samples of the factors and the buyers amount to a very considerable quantity of cotton. It is, of course, nothing in comparison with the 9,000,000 or 10,000,000 bales made, but still it is a very considerable amount of cotton. As I said before, in one year in New Orleans it approached 100,000 bales.

Mr. MERRIAM. That is very surprising.

Mr. SCOTT. How much constitues one sample?

Mr. WILLIAMS. They take out three or four pounds with an auger. The factor bores clear to the center of the bale with an auger and draws that out and puts it upon his table. The buyer also takes a sample and compares it with a factor's sample by which he bought. If it does not come up to the sample, he rejects it. If it surpasses it in quality, of course he quietly takes the cotton.

The CHAIRMAN. Do I understand they count each sample as a bale, and that that is where the mistake occurs?

Mr. WILLIAMS. No; after the cotton buyer is through with his business and the cotton factor is through with his, he takes all the samples on his table, all the common cotton, the middling, middling fair, or low middling and puts it together and sends it to be baled or pressed. Then he sells that.

The CHAIRMAN. Who does it go to?

Mr. WILLIAMS. That is his.

Mr. MERRIAM. That is extraordinary. It is toll with a vengeance.

The CHAIRMAN. It is 3 or 4 pounds out of every bale.

Mr. WILLIAMS. It is not such a very excessive amount when you come to compute the enormous quantity that is produced.

The CHAIRMAN. Why has not that cotton been enumerated at the gins? It has all passed through the gins.

Mr. WILLIAMS. Because when the cotton is ginned at the gins there is no sample taken out.

The CHAIRMAN. That does not make any difference.

Mr. WILLIAMS. All the gin reports is the number of bales of cotton that have been ginned. Very few of them report specifically the weight of each bale, for this reason: The gin charges per bale and not per pound, so there is no reason why they should weigh the man's cotton. He carries it to the warehouse, and when it is landed there it is weighed for the first time. Then the factor takes a sample out as the agent for the seller and puts it upon his table. He sells to the buyer, and then the buyer goes around and samples the cotton again. Then it is reweighed, and then it is bought at its weight, for two reasons; first, because in the sampling it has lost weight, and second, because in the course of time it has lost weight. Cotton dries out. If you take a bale of cotton weighing 500 pounds and keep it a year out of the weather, it will weigh considerably less.

The CHAIRMAN. What is the average shrinkage?

Mr. WILLIAMS. It will lose, say, 10 pounds. It depends on when the cotton was picked, the condition of the weather, and all that.

The CHAIRMAN. That would be 2 per cent. You kept no account of that so-called city crop, Mr. Merriam?

Mr. MERRIAM. No, sir.

The CHAIRMAN. And you have hitherto kept no account of the oil-mill crop?

Mr. MERRIAM. No; we have not been directed to do so by Congress.

Mr. SCOTT. I wish to ask Mr. Williams a question, Mr. Chairman. It strikes me the city crop to which you allude is accounted for when you have taken the returns from the gins.

Mr. MERRIAM. It is not, because they do not make returns by weight. They make returns by bale.

Mr. SCOTT. The final returns are not made by weight. The total crop is said to be four million bales, not four billion pounds, or something of that kind. The total crop is by bales, not by pounds. Therefore, it seems to me the returns from the gins would give it to you.

Mr. WILLIAMS. After we are through reporting the number of bales ginned, the Census Bureau reduces that to the number of commercial bales.

Mr. MERRIAM. Yes, bales of 500 pounds.

Mr. WILLIAMS. And the commercial bale, while it varies from year to year, is a certain number of pounds of cotton. They get a sort of estimate from the ginner that he has ginned so many bales, weighing in the average so much.

Mr. SCOTT. I did not know they considered it at all.

The CHAIRMAN. Now go on with your statement in your own way, Mr. Merriam.

Mr. MERRIAM. Is there anything further you want to ask me about the cotton-ginning report?

The CHAIRMAN. You were accounting for the discrepancies, were you not?

Mr. MERRIAM. I was going on to state that it has been the custom for the statistician of the Agricultural Department to take the returns from each decennial census and then, with such data as he can gather from the different agents in the country whom he employs, to make that the basis for a continual increase or decrease on a percentage basis for arriving at the probable crops each year.

Mr. WILLIAMS. Right there, if you will pardon me, I will say that was the custom of the Department, but it is not now. They send out their questions, and they are very frequently submitted to me. One of their questions is this: What percentage of a normal crop will be made in the territory under your jurisdiction? The statistician takes for granted the normal crop means an average crop, and then the Agricultural Department very carefully explains that it does not.

Mr. MERRIAM. Do you understand what it does mean?

Mr. WILLIAMS. If they would take the last decennial report, or would take the crop immediately preceding, an ordinary stupid fellow could tell about what percentage he was making upon his place over or under the last year's crop or over or under any designated crop; but they ask for a normal crop. I have had some correspondence with the Secretary of Agriculture about it, and he assures me that that system will probably be changed.

Mr. MERRIAM. I understood they used our figures—that is, the number of acres of improved land—as the basis for making their crops. I may be wrong about that.

Mr. WILLIAMS. You are right about the acreage.

Mr. MERRIAM. When we finished up the census of 1900 and made our figures they varied so tremendously that there was no real way to explain it, and I have before me a statement of the differences in a few isolated cases, because they are very noticeable.

The statement is as follows:

Comparative statistics of the Census and the Statistical Division of the United States Department of Agriculture, 1899.

Products.	Unit of measure.	Census.	Agricultural Department.	Difference, using Census figures as the base.
Barley	Bushels	119,634,877	73,382,000	− 46,252,877
Buckwheat	do	11,233,515	11,094,473	− 139,042
Corn	do	2,666,440,279	2,078,144,000	−588,296,279
Cotton	Bales	[a] 9,534,707	[a] 9,142,838	− 391,869
Flaxseed	Bushels	19,979,492	20,086,000	+ 106,508
Hay and forage	Tons	[b] 84,011,299	[b] 56,655,756	− 27,355,543
Hops	Pounds	49,209,704	42,354,000	− 6,850,704
Oats	Bushels	943,389,375	796,178,000	−147,211,375
Potatoes	do	273,328,207	228,783,232	− 44,544,975
Rye	do	25,568,625	23,962,000	− 1,606,625
Sugar beets	Tons	793,353	794,658	+ 1,305
Tobacco	Pounds	[c] 868,163,275	[c] 868,163,275	
Wheat	Bushels	658,534,252	547,304,000	−111,230,252

[a] Comparison made in commercial bales.
[b] The Department of Agriculture did not include forage.
[c] The Department of Agriculture used figures of the census.

That, of course, created considerable discussion, and there was selected to inquire into the differences a committee known as the National Board of Trade. They went over it, and they thought the areas were too large, that we had too many farm lands. The discussion has been going on for some time. They claimed that in 102 counties that there were too much farm lands as shown by the returns of the enumerator as compared with the divisions made by the geography. We ascertained some very curious things, by the way, in connection with that.

We found that in some counties the maps and the assessors and the enumerators all disagree. In other words, there was no standard by which to gather the information; but after carefully going over the figures in the 102 counties, we found a difference in nine counties sufficiently large to attract attention, but of course not large enough to affect the results of so large a collection of data as this agricultural division of our work is. There are over 840,000,000 acres of farm land area in the United States, and a few thousand acres do not cut any figure at all, practically.

So we were satisfied, after going over county after county—of course we found more or less errors, errors on the part of the enumerators and some on the part of the clerks in the office—that the figures were substantially correct, as near as figures of this kind can ever be made correct. It is impossible under any system that any of us know about to make these figures accurate in the sense in which you can balance a set of books, but they are approximately the results for all practical purposes.

It is very unfortunate to have two departments of the Government disagreeing as to their figures. It is better for one to take it all or for the other to take it all, because the public finally believes in neither. That must be the outcome of it, and while I am sure there will always be demands for estimates made by the Agricultural division, it seems to me it would be far wiser for the Government to stop the duplication of the work between the two departments. In the first place, there is the cost. We have a force that will always be kept at work. They are familiar with statistical work and will always have to be in training for each decennial census, which assumes greater magnitude each ten years.

Mr. HASKINS. Right there, Director: Your enumerators estimate the amount of corn, wheat, and oats when they go around?

Mr. MERRIAM. Yes; they go the first day of June of each decade.

Mr. HASKINS. And the Agricultural Department forecasts are forecasts of the present year, as I understand?

Mr. MERRIAM. Yes.

Mr. SCOTT. That is the way it has been, but it is not necessarily the way it will always be hereafter, is it? Take, for instance, the matter of the cotton crop of 1902. Did not your Bureau publish an estimate of that crop just before the holidays?

Mr. MERRIAM. We published the returns from the gins on the 18th of October. That was the first time we sent our agents around. That is the 1902 crop. We published another one the other day, and we shall finish it up in March; but those are not estimates except as they may estimate the amount not ginned.

The CHAIRMAN. They are actual?

Mr. MERRIAM. They are actual reports.

Mr. LAMB. Very frequently these volunteer reporters of the Agricultural Department do not travel all over the country. They sit down in their own place, and from the farms around them they make a general estimate.

Mr. MERRIAM. Oh, yes.

Mr. LAMB. When I was sheriff of my county I knew one of them very well. He lived in an out of the way place in the county and he made the reports for the county to the Agricultural Department. I watched his reports and I said to him: "If you had asked me I think I could have given you a more intelligent report, although you, of course, did your very best." That same thing occurs in many counties. Therefore it is impossible to get any approximately accurate report, the way they send out these agricultural statements.

The CHAIRMAN. I think you get a better return from a paid corps of men than from a volunteer corps.

Mr. LAMB. Exactly. The volunteer reporter takes his views from a few farms around where he lives, and he may never have been to the extreme end of the county at all.

Mr. SCOTT. I would like to recur now to the suggestion made by Colonel Haskins. It seems to me the entire value of any estimate of a crop to the farmers will depend on getting it to them before they have sold their crop. It does not do any good to them to let them know there was a short crop six months after they have sold what they have to sell; and what I would like to have General Merriam speak of is whether, under such an organization as he has, or which he thinks he can make, he can give the country this information in time to be of value to the people who have raised the crops.

Mr. MERRIAM. Of course it would be impossible to give any real figures until the ginners do their work. We can give it to them just as fast as they gin it.

Mr. SCOTT. Can you give as accurate an estimate as the Agricultural Division has been giving.

Mr. MERRIAM. That would be a pure matter of opinion. I do not believe much in estimates, you know. I think they make a lot of trouble. If you estimate too high, the price goes down. That dissatisfies the farmer. If you estimate it the other way, the men who buy the textiles do not like it because it sends the price up. It is unsatisfactory. There is no way on earth to determine the crop until it gets in the hands of sombody to count it.

The CHAIRMAN. When the cotton is ginned, that does not necessarily mean that it is sold?

Mr. MERRIAM. Oh, no.

Mr. SCOTT. I was going to ask you what value your October report was to the farmers.

Mr. MERRIAM. In the first place, a great many of them, I suppose, had not gotten their crop in at all at that time, because the ginning was only in its incipiency at that time, but it gave them a very good idea. We found that so many bales had been ginned. In every county, you know, we have these men, and in every vicinity they made an estimate of how much is in the hands of the farmers, and it is coming out about right.

Mr. SCOTT. Then you did make an estimate?

Mr. MERRIAM. But we always disavow any responsibility for it. Each can draw his own conclusions.

The CHAIRMAN. That is all they can do on the estimates of any Department.

Mr. MERRIAM. Yes; that is all they can do, of course.

The CHAIRMAN. Let me ask you for information: When the cotton goes to the ginnery, it is simply to get it in form to sell, is it not?

Mr. MERRIAM. Yes.

The CHAIRMAN. It is not necessarily sold?

Mr. MERRIAM. The planter can hold it as long as he wishes, or can borrow money on it, just as any farmer holds wheat in warehouses.

Mr. SMITH. Is it not true that the representatives of the spinners, if that is the proper word, are continually sending out estimates?

Mr. MERRIAM. Yes.

Mr. SMITH. Do you not think there ought to be some impartial man to send out estimates—a representative of the Government, for instance?

Mr. MERRIAM. Well, it might be a good plan to do it that way. Of course, it is always unsatisfactory, Mr. Smith, because it hits one side or the other.

Mr. WILLIAMS. Mr. Neale, a few years ago, sent out an estimate of 12,000,000 bales and we made about 9,000,000.

Mr. MERRIAM. As I understand, those interested in buying cotton cheap make the crop high because they want to depress the price. I understand the foreigners did that this year.

The CHAIRMAN. Let me ask you, Mr. Burleson, would an estimate based on the gin product, the actual gin baling, be a benefit to your Texas crop?

Mr. BURLESON. Certainly.

The CHAIRMAN. You do not want anything but that, do you?

Mr. BURLESON. Certainly we do. We want estimates of the growing crop. The Lancashire spinners, the representatives of the English cotton manufacturers, make an estimate of the crop from the very day the farmer commences plowing. They first say there will be an increased acreage or a decreased acreage. As a matter of fact they always say an increased acreage. Then when the farmer plants his cotton they report the cotton has been reasonably well planted, planted too early or too late. They usually report it was planted at the right time. Then when the cotton comes up they report the cotton is in a reasonably thriving condition and will make a given per cent of a normal crop. They constantly make estimates, from the beginning of the cotton season down to the very last minute.

The real purpose that has been subserved—the substantial benefit that has been given the cotton-producing classes in the South by the

Agricultural Department—is that we have had an impartial estimating body, and whether it is accurate or inaccurate, whether it has served to hit close to the figure of actual production or not, it has saved the cotton producers of the South millions of dollars.

The CHAIRMAN. Is any of the cotton sold, except on a margin, before it is ginned?

Mr. BURLESON. Certainly. You must remember the majority of the cotton crop is sold and consumed before it is picked and ginned. While Governor Merriam has said he does not believe much in estimates, as a matter of fact the Agricultural Department, through the means of its statistical division, has stood between the producers of cotton and these cotton spinners in England, represented by the cotton brokers in this country, who are constantly giving out estimates from their standpoint—such men as Mr. Will, Mr. Bustin, and others.

The CHAIRMAN. Granted that that is what is wanted, have you the means to accomplish it, Mr. Merriam?

Mr. MERRIAM. Certainly; these same agents that I keep all the rest of the time could make estimates every month, if that were thought advisable. I have the machinery running now. There are 640 of them, and they can make an estimate every month if Congress gives me authority to do that.

Mr. SMITH. Mr. Merriam, what I really want to get at is this: The general plan of your Bureau is to get as near absolute accuracy as possible?

Mr. MERRIAM. Yes.

Mr. SMITH. And with that in view, is it not the general policy of your Department to wait until you can get accurate information instead of indulging in estimates?

The CHAIRMAN. That would be a matter of direction by Congress.

Mr. MERRIAM. That would be a matter of direction by Congress. I have the machinery for making these estimates that would probably be more accurate than any estimate made by any other Department of the Government.

Mr. SMITH. We are here to get information, not to take either side. There is no cotton up in my country.

Mr. MERRIAM. I understand.

Mr. SMITH. My idea was that if you had legislation to enable you to do this, or authorize you to do it——

Mr. MERRIAM. Probably Mr. Burleson knows there was a resolution introduced the other day for me to take an estimate in April by these agents, and also instructing me to take an estimate of the amount consumed by the textile mills and of the amount sent abroad.

The CHAIRMAN. The machinery is now in two places. I want to find out what is best to be done.

Mr. HAUGEN. You could perfect your organization to do that work in the Census Bureau?

Mr. MERRIAM. Of course; I can do anything of that kind

Mr. SMITH. You would be able to do it more cheaply, considering the accuracy and the better facilities for doing it?

Mr. MERRIAM. Certainly, because we have all the machinery all the time, you know.

Mr. SCOTT. What did you mean when you said you were planning to make a weekly report?

Mr. MERRIAM. Under the act creating the permanent Census Office we were instructed to make a weekly report on the amount of cotton ginned, but we did not start in until July to organize, and I could not get around to it.

Mr. SCOTT. When is that report to begin?

Mr. MERRIAM. We have to work up to it gradually.

Mr. SCOTT. I mean what time in the year?

Mr. MERRIAM. Commencing in September and running until about the 15th of March. That is the cotton season.

Mr. SCOTT. It was not contemplated that you would publish any such estimates as Mr. Burleson has spoken of?

Mr. MERRIAM. No; there is a resolution which has gone in now directing us to do that. I do not know whether it will be passed or not.

Mr. HAUGEN. Do I understand you have a reporter in each county?

Mr. MERRIAM. Yes; he is employed by the day.

The CHAIRMAN. What is the average compensation?

Mr. MERRIAM. About $100 a year, and a man must necessarily become pretty familiar with the county. He is a resident there and he is running around all the time. Do you not think, Mr. Burleson, that these same agents could do this work?

Mr. BURLESON. Unquestionably; but in that connection I do not wish my position to be misunderstood, and if the committee will permit me I desire to say a few words.

The CHAIRMAN. We sent for you, Mr. Burleson, knowing you represented a great cotton constituency, and we want to hear your views.

Mr. BURLESON. It is to the interest of the Government, from the standpoint of the cost of gathering statistics, that there should be no duplication, and for the reasons given by Governor Merriam, there ought not to be two divisions or bureaus engaged in the same statistical work, because necessarily there will be conflicts.

The CHAIRMAN. Naturally there will be disagreements.

Mr. BURLESON. Yes; and people thereby will lose confidence in them. There is now pending a bill creating a department of commerce, and it is to embrace the Census Bureau, as I understand it. If the Census Bureau is to remain an independent bureau, and it is now measureably independent, I am perfectly satisfied to have it gather these statistics; but the Census Bureau under a department of commerce to gather cotton statistics, must be viewed by me as an entirely different proposition. I will make my meaning plain. We all know that there is an antagonism—I may use too strong a term; I will say there is a conflict of interest—between the producer of cotton and the manufacturer of cotton, because it is to the interest of the manufacturer——

Mr. HENRY. Would you not say the cotton broker rather than the manufacturer?

Mr. BURLESON. Both—it is to the interest of the cotton broker and also the manufacturer in England as well as in America to buy cotton as cheaply as possible. It is to the interest of the producer to sell his cotton for as high a price as he can command.

The CHAIRMAN. That applies to all products, grain, cattle, and everything all the world over.

Mr. BURLESON. Certainly. Now, if the Census Bureau is to be covered under the department of commerce, and a man should be placed at the head of the department of commerce who would magnify the importance of the manufacturing interests of this product, unquestionably the interests of the producers of cotton would suffer if the gathering of these statistics were undertaken by the Census Bureau under the direction of the department of commerce. It is reasonable to believe that the commercial or manufacturing interests will ultimately dominate in the department of commerce. If the Census Bureau is to be placed under the department of commerce, as a representative of the producers of cotton, I shall persistently oppose the transfer of the statistical division of the Agricultural Department to the Census Bureau at any time, because I believe that if it is so transferred, ultimately the commercial interests or the manufacturing interests will dominate that great department, and the interests of the producer will necessarily suffer.

As I said a minute ago, I agree with Director Merriam that as a general thing estimates are not of much value, but we must remember that this is the great staple crop of the United States, not even excepting wheat; and from the very minute the seed is put in the ground, and even before it is in the ground, the shrewdest men in the world are here representing the English spinners and the New England and Southern manufacturers, and are constantly engaged in making and publishing estimates of what the crop is going to be. The effect of which, of course, is felt in the price paid for our cotton.

The CHAIRMAN. And we can not stop that estimate?

Mr. BURLESON. Of course we can not stop it, but at the same time we ought to have some means of offsetting the evil effect of it upon the producers by having an impartial tribunal, an impartial instrumentality, to make an estimate for the cotton producer, not that it is to be an inaccurate estimate, but to make known to him the real truth of the situation, if possible, in order that he may govern himself accordingly.

Gentlemen, I have been a producer of cotton since before I was 21 years old. I know something about it. I stand here to assert. and it can not be contradicted by any man who is in possession of the facts, that the statistical division of the Agricultural Department, while it is not claimed it has been mathematically exact in its estimates, it has saved the cotton producers of the South millions of dollars by giving to the producers of cotton what they think and believe and what I believe is an impartial estimate of what is to be the cotton crop of the United States for the current year.

In line with what Mr. Williams, of Mississippi, said a minute ago, this man Neale had the effrontery on one occasion when his estimate was corrected, to state, so it was published by the press: "Well, I am not beholden to you," meaning the producer of cotton; "I represent the Lancashire spinners;" and his estimates finally became so notoriously inaccurate that he has been practically driven from the field as a forecaster of crop results, but he has been succeeded by Bustin, another gentleman of the Neale type, shrewd, smart, and cunning, who is constantly making estimates. Neither does he represent the cotton producers, but he does his spinners.

The CHAIRMAN. Right there, why is the cotton planter bound to observe those estimates, knowing their source? Is he not independent enough to wait for the Government reports?

Mr. BURLESON. Certainly. He does not observe these estimates, but the price of his cotton is affected thereby.

The CHAIRMAN. What do they amount to then as far as the cotton planter is concerned?

Mr. BURLESON. They amount to this: He is not controlled by these estimates, but as I have said, the market is affected by these estimates of the representatives of the spinners, especially if there is no other estimate; but if there is an impartial bureau that makes an estimate it immediately offsets the evil effect of the estimates made by the representatives of the cotton spinners.

The CHAIRMAN. There is no proposition here to eliminate a Government estimate. What the committee is considering is the proposition whether the Government could not do this work in what you might call the statistical bureau of the Government just as well as the Agriculcultural Department now does it, and save the duplication of work.

Mr. BURLESON. It goes without saying, Mr. Chairman, that there ought not to be duplication; but, as I said, it depends altogether on what influences the Census Bureau is to fall under whether I would be willing for this estimate of the cotton crop to be made by the Census Bureau.

The CHAIRMAN. We are here to legislate for all sides. That objection might be upheld by the other side of this question as against the Agricultural Department. The manufacturers are entitled to protection just as much as the cotton growers. The miller in Minneapolis is just as much entitled to protection as I am as a grower of wheat, and they might raise that objection against the Agricultural Department.

Mr. BURLESON. And I would not deny them that protection. What I want is an impartial tribunal or an honest piece of Government machinery to make this estimate.

The CHAIRMAN. That is what we all want.

Mr. HAUGEN. Is not one department as likely to be influenced as any other?

Mr. BURLESON. Is that question directed to me?

Mr. HAUGEN. Yes.

Mr. BURLESON. I do not think so, if these statistics were being gathered by the Agricultural Department with a man at the head of it who is directing his attention to agricultural matters; but it might be influenced, and that, too, against the producer, if the Census Bureau was under the department of commerce and some man who would exalt or magnify the manufacturing interests of the country was at the head of that great department.

Mr. HAUGEN. The manufacturing department might make that same objection to the man employed solely by the Agricultural Department.

Mr. MERRIAM. May I say a word, Mr. Chairman?

The CHAIRMAN. Certainly.

Mr. MERRIAM. I wish to say to Mr. Burleson that I think he is unnecessarily alarmed about that. I am at present under the Interior Department. Under the present Census act the Interior Department has practically nothing to do with the work of my Bureau. We are nominally under that Department, because the Bureau is under that Department, but nobody has suggested such an idea to me.

The CHAIRMAN. To tamper with the figures.

Mr. MERRIAM. Yes; are you not a little suspicious, Mr. Burleson?

Mr. BURLESON. No; I want to make myself clearly understood. I think the Secretary of Agriculture will bear me out in the statement that two years ago I brought to his attention this same matter and he agreed with me that the duplication of statistical work in reference to cotton ought to be stopped, if possible. I am opposed to the gathering of statistics in these various departments of the Government, and I am free to admit now that if the Census Bureau is to remain as at present constituted I would be in favor of transferring the statistical division of the Agricultural Department to the Census Bureau; but I am not willing to transfer the statistical division of the Agricultural Department to the Census Bureau if it is to be placed under the Department of Commerce, and that does not involve any reflection either upon the integrity or intelligence of the present occupant of that office. I think the reasons are patent.

Mr. HENRY. Mr. Chairman, just one word. I want to correct Mr. Burleson, if he will permit me. I know that what he says he says in good faith. I have some slight knowledge of cotton manufacture and I do not think the cotton manufacturer is interested in false reports. The cotton manufacturer, whether in New England or South Carolina or in Alabama, is interested in accurate reports. So is the English manufacturer. It is the broker who is interested in these fictitious reports. The gentlemen that Mr. Burleson refers to, as I understand, are not representatives of the Lancashire manufacturers, but of English dealers and brokers. I want to make that distinction. It all amounts to the same thing in the end, but the Department of Commerce should not be besmirched here simply because the name "commerce" is different from "agriculture."

Mr. SCOTT. And a department which does not exist?

Mr. HENRY. I believe it will be administered just as conscientiously in one department as in the other, and that the manufacturers are interested in having accurate reports.

The CHAIRMAN. Let me call the attention of the committee to this fact, also, that we are not only dealing with cotton statistics, but with statistics of all crops—wheat, corn, oats, and everything.

Mr. WILLIAMS. I understand that, Mr. Chairman, but I understand another thing very clearly. Mr. Henry is precisely right in stating that the manufacturer is just as much interested as the producer in an impartial crop report. He is just as much interested, and no more. He is interested on his side. The producer is interested on his side, and that is the honest fact about it. The manufacturer wants to buy his cotton as cheaply as he can get it. The planter wants to sell his cotton as high as he can sell it. The planter is always delighted when a crop report comes out showing a bullish effect on the market. The manufacturer is always delighted when a crop report comes out and bears prices down. It stands to reason and common sense.

The manufacturer is not any better than anybody else. Although the history of America would lead us to suppose he belongs to the privileged class, he is not any better than anybody else, or any smarter, or any more moral. He wants to buy his raw material just as cheap as he can get it, so as to furnish him with a margin to sell his manufactured product at a profit. So he is interested, and does everything he can do every year to reduce the cotton to a minimum. When I sell my cotton in Mississippi I sell it to an agent of a Fall River manufacturer. The man whom the agent represents wants to buy it as cheap as he can, and the agent wants to buy it as cheap as he can, because the more margin he has the more profit he makes. The cotton planter, therefore, stands by himself, with the balance of the world against him wanting cotton cheap.

The man who wears the cotton wants to buy it cheap, provided he has any sense, and I take it for granted he has. My own view is that you could not get an impartial report of the cotton crop or the corn crop or the wheat crop or anything else from anybody. The manufacturers have already been complaining that the Agricultural Department has been fighting in favor of the farmer, and, to a very slight extent, I suppose it is true. The other departments would probably fight in favor of the manufacturer; and if you get two of them, they would offset each other. That is about the way it strikes me.

Mr. **Burleson.** And that is the way it strikes me.

The **Chairman.** And the poor purchaser would be like a jackass between two bundles of hay. He would not know which one to take.

Mr. **Williams.** That is it exactly. If you take a bureau of statistics and have it an absolutely independent power, having nothing to do with agriculture and nothing to do with commerce or manufactures, it would come nearer giving an absolutely impartial report than any machinery I can suggest.

The **Chairman.** It does seem to me that this duplication ought to stop. The actual cost ought not to be considered too seriously. What we want is one Government report on these facts, and let that report stand or fall. If it is inaccurate we will change the machinery. But this idea of presenting to the producer two reports, not knowing which one is inaccurate, is an injustice to your people, Mr. Burleson.

Mr. **Scott.** Mr. Burleson, if each of these divisions would limit itself to its legitimate and proper field, would there really be a duplication? That is to say, would not the agricultural division deal simply with estimates and forecasts, while the Census Bureau would deal with statistics? The agricultural division would publish early in the year a guess of what the crop would be later in the year or the following year, and the Census Bureau would publish what the crop actually was.

Mr. **Merriam.** May I interrupt you? We discovered this fact in sending our men to the gins, that the Agricultural Department was asked questions by these very ginners. The result is that the poor ginner has somebody after him constantly to get facts. There is no sense in our getting the same facts the Agricultural Department gets. We keep the poor devils stirred up from morning to night. In other words, you had better let the machinery of one branch of the Government get this information.

The **Chairman.** As the matter stands now, there are two corps of men in the field practically doing the same identical work.

Mr. **Scott.** Your suggestion is that the Department could get the estimates and also get the accurate facts.

Mr. **Merriam.** I would not like to say anything in regard to the plans of another Department, because that would not be quite courteous, but I say if I am directed to do this I have the machinery with which to do it.

Mr. **Dahle.** When you speak of machinery, you mean help?

Mr. **Merriam.** Yes; we have a certain number of men employed regularly, and they could get this information as well as that which they already get. The cotton crop is the only one susceptible of accuracy in the collection of statistics. In order to get the statistics in regard to wheat and corn, we would have to make an enumeration of the entire country by enumerators, and it would cost $2,000,000 to make it properly. Of course we could go to the manufacturers and get returns, and we could get returns of the amount of cotton sent abroad, but there would be a certain amount left over in the hands of the farmer all the time that we never could reach.

The **Chairman.** The Division of Statistics of the Agricultural Department does make estimates in regard to wheat and corn.

Mr. **Merriam.** It has to.

The **Chairman.** How do they do that—through these voluntary agents?

Mr. **Merriam.** They have agents in every county in every State. They have two or three hundred thousand agents.

Mr. **Scott.** They have 234,047 voluntary agents. That is in addition to a State agent, who is a paid official in each State, and who has under him certain other voluntary correspondents in addition to this number.

Mr. HAUGEN. I presume we would have no trouble in finding as many volunteers as they have in the Agricultural Department.

Mr. SCOTT. It seems to me a natural thing that these volunteers, who are already engaged in this work, could be directed to report to the Census Bureau instead of to the Agricultural Department.

Mr. LAMB. There would be books and all sorts of things to send out. That is the way they get paid.

Mr. SCOTT. Yes; that is the way they are paid.

Mr. MERRIAM. They are paid in seeds and pamphlets.

Mr. WILLIAMS. Regarding this from the broader standpoint of an agricultural proposition, I do not believe you can ever get an accurate statistical report about any crop that is mainly consumed on the farm.

Mr. MERRIAM. You can not do it absolutely.

Mr. WILLIAMS. I do not believe you will ever get it. The cotton crop is peculiar in this respect, that it is not consumed on the farm. It is all sold.

Mr. MERRIAM. Yes; you can reach it.

Mr. WILLIAMS. It is almost legal tender. There never was a day when you could not sell a bale of cotton. There are days when you can not sell a bushel of wheat or a bushel of corn. You not only can not estimate the corn crop very well, but you can not tell after it has been made how much has been made.

Mr. SCOTT. Then it is your opinion, Mr. Williams, that whatever estimate is made and published by any division in the nature of a forecast of the wheat or corn crop would not be of any use to the farmers.

Mr. WILLIAMS. No, I do not mean that; because while they miss it, they miss it in the same proportion year after year, and while they miss the number of bushels made, the comparison with the foregoing year or the year prior to that remains substantially the same. I think it is of great value to the farmer and of great value to whoever is seeking the truth of the situation as near as they can; but as far as getting the number of bushels of wheat or corn raised, or the number of pounds of hay raised, I do not believe any machinery could do it, because most of it is consumed on the farm and the farmer makes no report. He can not make any report. He can not keep any account, while the cotton raiser does keep an account of every pound of cotton he raises.

Mr. WRIGHT. It seems to me if I were a manufacturer I would be equally interested in having an accurate report upon the prospects of the cotton crop just as much as though I were a producer of cotton. If they estimated 12,000,000 bales, I would be holding back and I would not contract, and then when the crop did come in and the statistical part showed there were only 9,000,000 bales, I would secure my contract.

Mr. WILLIAMS. It would not affect you at all, because in the meantime you would have bought in the future market, and a lot of fellows would have the cotton to deliver.

Mr. SMITH. Is it not true that while you might be interested in having accurate knowledge you might not be interested in having the fellow who was going to sell have accurate knowledge?

Mr. WRIGHT. Well, he has the same knowledge I have.

Mr. WILLIAMS. I think the Agricultural Department ought to be confined altogether to the work of forecasting. It ought to leave purely census work to the Census.

The CHAIRMAN. Supposing, Governor, that Congress turned over to the Census Bureau the duties now performed by the Division of Statistics of the Agricultural Department, what, in your judgment, would be the cost of doing that same work in any way you choose to do it? Have you any idea about that at all?

Mr. MERRIAM. So far as the clerical work is concerned there would be a reduction of expenses. What it would cost in the way of estimating would be a matter of guesswork at present. You know they do not spend very much money in field work. Of course there would be a considerable saving in the statistical branch because we have the machinery there all the time to do that branch of the work.

Mr. SCOTT. They do not pretend to do any actual statistical work, do they?

Mr. MERRIAM. They do statistical work. It is called the Division of Statistics.

Mr. MERRIAM. They tabulate these returns. They get all this stuff into an office, and then they segregate it and separate it and make reports.

Mr. SCOTT. After they have their reports on which they base estimates they do not send a lot of officials around to verify it.

Mr. MERRIAM. Oh, no.

The CHAIRMAN. You might better call this a division of estimates or a division of estimating.

Mr. MERRIAM. That is it.

The CHAIRMAN. These voluntary reporters or observers that the Agricultural Department now pay practically by books and seeds and that sort of thing could be put on the list of the Department of Agriculture and supplied with seeds and books just as they are now?

Mr. MERRIAM. Oh, yes; they could be sent out in the same way.

The CHAIRMAN. And the result would be that all the statistical work would be brought together in what is peculiarly and specifically the statistical bureau of the Government. As far as the cotton crop is concerned, I should think the estimates could be sent out by the Census Office from week to week or from month to month, and then, in October, from the ginneries practically a correct figure be given out.

Mr. BURLESON. What we really ought to have is an independent statistical bureau, which could be called on by any department of the Government for statistics. It ought to be permanent and segregated from any other Department or bureau.

Mr. MERRIAM. It ought to be independent. That is all very true.

Mr. BURLESON. And if so there would be no objection to consolidating all statistical work under it.

The CHAIRMAN. That is what we have now, a Bureau of Statistics, which is called the Census Bureau. They are to deal with all the statistics of the country of all kinds—agricultural, commercial, manufacturing, anything you please—and the point I wanted to bring to the attention of the committee was whether it was feasible, in our judgment, to transfer this thing to this Bureau of Statistics. Of course the matter of cost ought to enter into it somewhat, but it ought not to govern it entirely.

The committee, at 3.15 o'clock p. m., adjourned.

SUBCOMMITTEE ON APPROPRIATIONS OF THE
COMMITTEE ON AGRICULTURE,
HOUSE OF REPRESENTATIVES,
January 14, 1903.

The committee met at 10 o'clock a. m., Hon. James W. Wadsworth in the chair.

Hon. James Wilson, Secretary of Agriculture, appeared before the committee.

The CHAIRMAN. We have come together this morning in regard to the statistical division of the Department of Agriculture, with regard to what to do with it. Mr. Harvey, representing the National Board of Trade, telegraphed asking for a hearing, and I have asked Secretary Wilson to appear and give us his views on that matter.

The question has arisen, and the committee has been considering it, of the transfer of this department of your Bureau. They have read your report and will abide by your judgment in that regard, but the point to be considered is that of the feasibility of transferring all the statistical work of the Government to the Census Bureau, and that would include your statistical bureau, and on that point, in particular, we would like to have your opinion.

Secretary WILSON. I will try to give you my opinion briefly with regard to how the proposition strikes me, and it might be well enough for the gentlemen who represent the Board of Trade to hear how I present things, and they might then have a more correct idea of what they think would be wise and for the benefit of all the country, and so I am willing to forego the pleasure of hearing them speak first.

Preliminarily, let me say that the Department of Agriculture in the last six years, under your guidance, has been doing as much work for the American farmer as is done in all the other countries of the world for farmers, and I think that it is doing much more, and it may be interesting to some of you gentlemen to recall what you have been doing along those lines.

We have as much money for research as the five greatest educational institutions in the United States. Harvard, Yale, Columbia, Chicago, and Leland Stanford all put together have not any more money than the Department of Agriculture expends every year. You have put it in my power, since I came here, to more than double the working force of the Department, and to reach out and to embrace in our field of operations, and bring within our sympathies, the people who produce in the fields, in all the States and Territories of the Union, and not only so, Mr. Chairman, but in new islands of the seas under our flag.

It may be permissible for me to say that in taking charge of the portfolio of agriculture I desired to reach everybody that needed help. I desired to get in touch with the man with his coat off in the field, everywhere, so as to help him produce. Sixty-five per cent of everything we export to foreign countries comes from the farmer, and a very large per cent of the 23 or 24 per cent of the goods we export which originate with the manufacturer are only worked over a little after having come from the farmer.

I have had the ambition of building up in this Government of ours a great unit, consisting of scientists along special lines that are needed to help the producer in his struggles with nature. You are well aware, all you gentlemen of the committee, of the work done by the Weather Bureau, how it has extended and grown, and you no doubt have in mind the work about to be done by that Bureau when the facilities of the

Pacific cable are put at its disposal. We will follow storms around the globe, Mr. Chairman, just as soon as the new cable being laid now reaches the Orient. And you are well aware of the excellent work that is being done by the Bureau of Animal Industry—a work which does not need illustration here—especially that part of it which is being done in New England.

The Bureau of Plant Industry has been extended and developed with your encouragement until there are 200 scientists studying plants, both at home and in the islands of the sea under our jurisdiction, and we have created and built up a Bureau of Soils, and are studying the soils of the country—something that has never been done here before; never in any other country under the sun. That is where people should begin to study agriculture; the adaptation of this soil and that to this purpose and that. And so you have gone on, as you very well remember, in developing the several features of this great agricultural unit, until the nations of the earth are sending people here to inquire into the American Department of Agriculture and its work.

There are forty Germans coming from that old nation that has had such a reputation for research, and I have agreed to send a guide over the country with those men to show them what we are doing. One feature of our work—one of the component parts of the Department of Agriculture—has not developed and has not grown, because within the last few years, while you have been building up and developing the other bureaus and divisions of the Department, the question that is now presented to me has been an open question. The Division of Statistics has been in the air. The question came as an economic question, "Can not we bring together all the statistics of the Government under one head and thereby save money, and have this saving without loss of efficiency?"

My mind was open on that matter. I did not know whether it could be done without destroying the efficiency or not, until you called upon me to look into the matter in the last appropriation bill, and until I made careful investigation of all the details of the work of our own divisions. I know comparatively little about the statistical work of the Treasury Department, except as I read its reports; but a very large per cent of the reports of the Treasury Department deals with agricultural products, because, as I said, over 65 per cent of everything that goes abroad as exports goes directly from the farmer. The Census people have come into being to take the Twelfth Census, and the question which naturally comes to most minds is, Can these gentlemen do this work for the Department of Agriculture as well as the Department of Agriculture can do it for itself, and save money in the doing of it? That, I understand, is the question that now presents itself to us.

The CHAIRMAN. And also there is the question of the prevention of the duplication of work.

Secretary WILSON. And also the prevention of the duplication of work. One thing or another should be done, and done at once. The condition of our country requires, and the condition of our imports also requires, a careful looking to the future as it may be affected by the position that you take. We have been importing in the last few years from foreign fields about the equivalent of one-half of the things that we export from the fields of the United States. For example, in the year 1900 we sold $844,000,000 worth of things from American fields, and we bought $420,000,000 worth of things from foreign fields.

An inquiry into the sources of that large amount of imports showed that we buy about $200,000,000 worth of things, or have been buying

$200,000,000 worth of things, that can be grown in the United States, and $200,000,000 worth of things that can not be grown in the United States, but grow in tropical countries. The idea occurred to me that my greatest usefulness to the country would be to endeavor to help the people of the United States to produce that $200,000,000 worth that we can produce, and to help our brown men in our new possessions to the production of the $200,000,000 worth that we buy from tropical countries.

Along these lines we have been addressing ourselves, and I need not tell this committee that we took up the beet-sugar industry when it produced something like 30,000 tons, and have encouraged it and helped to carry it on until this last year there was probably 260,000 tons of beet sugar made in this country, and that five or six years ago we produced 25 per cent of our rice, and that we sent scientists to the Orient and found rice suitable to the Gulf coast, resulting in the production in the last year of an amount equivalent to all the rice used in the United States. We found that we could grow the Sumatra wrapper tobacco that has been costing us $6,000,000 a year, and we have also found where we can produce the fine aromatic filler tobacco that goes into the finest brands of cigars, and it will be only a few years when the $8,000,000 paid annually for fine cigars is saved to our own people.

We went to the upper branches of the Volga, in Russia, and found the macaroni wheat, and brought it to the United States, and extended the agricultural area of our country far into the desert, because this wheat grows with 10 inches of rainfall. Two million bushels of it were raised last year, and probably twenty millions will be raised next year. You are familiar with what we have done for the fig industry of California. There were hundreds of thousands of trees, and not a fig on them. There were produced there probably 100 tons of figs last year. We sent across the Sahara Desert and brought out the fine date palm, and took it to the desert regions of Arizona in order that we might try it there, and it was successful. And the greatest work that is now before us is in regard to the world's supply of cotton. Russia is anxious to grow her own cotton, and be independent of us. Germany is anxious to go to her own possessions in Africa and grow her own cotton there, and the British people have dammed the Nile, and are going to dam it again and again, no doubt, to save all the waters in that great stream and grow their own cotton, and be independent of us.

And in order to be ready for that struggle which is coming, Mr. Chairman, we are at work hybridizing and creating new varieties of cotton to enable our people to keep in the lead.

Now, this is somewhat aside, but in order to fairly consider whether you can lay your hand upon one of the units of this Department of Agriculture that is doing this work, I ventured to say a few words with regard to the magnitude of the work under your hands. Now, we must come directly to concrete facts. We have organized work in this division of statistics that is decidedly ahead of what was done there six years ago.

When I came to the Department I found that there was not much credit given to the division of statistics. I called for the resignation of the gentleman at the head of it, and I told him very frankly that I did not believe that all he could do and all I could do would command confidence in the work of that division, and so I went to the President, and to the Cabinet, and to the scientists of the city of Washington, and I took plenty of time and I consulted, and I finally got a man at the head of the division of statistics who was recommended to me by nearly everybody. Statisticians are very, very scarce. Mr. Hyde had had something to do with the Eleventh Census. He did not have all of the work. He did not have the animals and horticulture, but he had the rest of it, and so he was recommended to me.

The CHAIRMAN. He was the agricultural statistician?

Secretary WILSON. Not altogether. He had the rest of it, but not live animals and horticulture. So I went to work then to organize along such lines as would bring about more efficiency and unquestioned integrity. Now, if you will bear with me, I would just like to call your attention to a few things in my report to you that indicate the lines along which we are working, and I will not read very much. I am quoting from myself: I state: "The principal feature of the crop-reporting system of the division of statistics is the correspondence of a large number (upward of 250,000) of farmers, bankers, merchants, cotton ginners, agents of transportation lines, mill and elevator proprietors, and other persons." We could not take the position, sir, that we are going to deal entirely with the producer.

I have been a producer all my life. I know the producers very well. We farmers do not keep books on the farms. There is not one farmer in a hundred that weighs his crop. Now, we have to come directly to the question of considering the value of the two systems of getting facts with regard to production and farms. The one is by the house-to-house visitation, of the census, and the other is by this system of ours. The object of the census is to take care of the history of the past, and the object of the system of estimating that we have is to put in the possession of all this list of people that I have named—the farmers, the bankers, the merchants, the cotton ginners, agents of transportation lines, mill and elevator proprietors, and other persons—the facts with regard to the crops before they move. That is the object of it in distinction from historical inquiry after crops have been sold.

Now, the question is whether we have been doing this with any considerable degree of accuracy. You send the house-to-house visitor to the farmer, and he asks him—he gets, I think, 15 or 20 cents, or something like that, for each farmer that he visits, and is paid by the number and the amount of work that he does—he comes to me, a farmer, on my farm, and he says to me "How much corn did you raise last year?" I say, "I don't know; I had about so many acres, off and on; I don't know exactly about that." Then he says, "About how much have you got per acre?" I say, "I don't know; it runs from 25 bushels to 90 bushels an acre, here and there."

"How much wheat did you raise?" "Well, I raised some wheat, but it hasn't been thrashed, and I don't know just how it will come out;" and he goes on all the way through, and I am honestly giving him my guess as to what really happened on my farm. He takes that, and that is the best that he can get; and he goes to the next farm and goes through the same thing, and after he goes to a hundred farmers he finally finds one that keeps clerks and keeps books. But the kind of farmers that I was raised among do not do that. They can not afford to keep clerks and keep books.

Now, I am not satisfied that the information gotten by that man can be called facts. We have a different plan altogether and I would like to call your attention to it. This organization of ours, as I have had it built up, includes thirty-eight State statistical agents, and they receive a compensation of from $300 to $800 per annum. They are selected from men who are supposed to be the best informed in the State in which they live, who have a general knowledge of the effect of a season on a crop, and can tell with considerable accuracy whether reports coming to them are valuable or otherwise.

Now, each of these maintains a corps of correspondents entirely independent of those reporting to the Department at Washington, and such correspondents, ranging from 21 in Delaware to 517 in Michigan, aggregate 9,048 people reporting to the State agents in those States. They are selected by the State agents, and they are intelligent farmers and business men. Some of them have reported for twenty years. They know that they are going to make those reports, and they have an eye out with regard to the growing of the crop and results from the growth of that crop. They are considering it more than the individual farmer is considering it.

The State agent does something more than simply tabulate the correspondence, or the work could be just as well done in Washington. He analyzes and coordinates the reports in the light of his own knowledge of conditions derived from personal observations and other sources. It is a pretty intelligent estimate which is made by men who are doing it every year.

In each agricultural county the Division of Statistics has a correspondent who makes the county the geographical unit of his report. Every such correspondent has from two to four assistant correspondents, whose duty it is to keep him informed as to the agricultural conditions prevailing in their respective districts. These county correspondents and sub-correspondents number 10,792.

So much for the county work. I call your attention now to the county reports made to the State agents, and to the county reports to the statistician in Washington.

In every township and voting precinct in which farming operations of any kind are carried on the Division of Statistics has a correspondent who makes such township or precinct the basis of his report. These correspondents number 30,232.

The State statistical agents and their correspondents, together with the county and township correspondents, numbering in all 50,072, report eleven times in each year.

For the purpose of rendering his cotton reports more complete and reliable, the statistician also corresponds during the growing and picking season with 61,170 public and private ginneries and with 14,577 bankers, merchants, and other persons not actual growers.

Now, it is possible that a few of these ginneries may have been duplicated to us. That is, from all the sources different names for the same individual may possibly have come; but there are substantially 61,170 public and private ginneries in the cotton-growing States. Fourteen thousand five hundred and seventy-seven bankers, merchants, and other persons, not actual cotton growers, also report with regard to cotton.

Similarly, as a check upon the reports on cereal production, he utilizes the services of 24,074 millers, elevator men, and other nonfarmers.

It would not be fair to the United States to depend entirely upon the man who produces. The banker, who loans money, and other business men are well informed in their several communities, as is also the miller, who grinds and deals in grain.

Finally, at the end of the growing season, 84,154 farmers and planters report on the results of their own individual farming operations during the year.

The farmers report every year. They are selected farmers; they are all most intelligent farmers. We want them to report directly to us with regard to their own operations on their own farms.

Now, there is another special line of reports. Seven cotton agents, stationed at as many principal Southern cotton markets, and paid a compensation of from $20 to $50 per month each, report weekly as to the receipts and shipments of cotton.

This is for the purpose of giving us a check on the estimates made by others. A very good test is the amount of cotton shipped out. It is not a complete test, because sometimes cotton is held back.

Every transportation line in the South reports the amount of cotton it carries, with the points of origin and destination, and Southern mills without a single exception report their purchases of cotton during the year, for use in the preparation of the final cotton report, issued as soon after the close of the cotton year as the necessary data can be collected and compiled, and this is the principal value of our estimating system. Private parties make estimates for their own use or to sell; we give ours to the world.

The number of statistical correspondents of all classes in the cotton States, inclusive of railroad and other transportation agents, is 147,261, and the total number in all the States and Territories in the Union is 256,047, ranging from 285 in Nevada to 20,094 in Texas.

The division of statistics has also 6 special field agents, whose duty it is to watch carefully the development of each important crop throughout the entire period of its growth and to keep in close touch with the best-informed opinion in regard to conditions and prospects.

The reports received from all these various sources are not dealt with in mass, but those of each class are separately tabulated, with a view to the determination for the Statistician's future guidance, of their respective approximations to accuracy.

The total number of reports handled by the 70 employees of the Division of Statistics in Washington has been as high as 2,500,000 in a single year. It is only because the various agencies employed in the collection of this immense amount of statistical material are, except as above stated, voluntary agencies, that the magnitude of the Department's crop-reporting organization and its possibility of increased usefulness are not more adequately recognized. But, as already stated, the promptitude with which the information thus gathered is made public constitutes its chief value.

Now, I want to say a word, gentlemen, with regard to the value of the voluntary agents as compared with that of paid agents. We can not compensate this corps of a quarter of a million men in cash, and we do not think of it. You give us $141,000 to do all our work, and we could not think of paying these men anything. But we do compensate them in another way, and satisfy them. We make them special citizens of the United States, so far as we are concerned. We send seeds and documents to every man of them. Of the number of year books assigned to the Department of Agriculture, we give 30,000 to these men. We have a little paper published, a report, called The Crop Reporter, and they get that and nobody else gets it; and they are satisfied.

They know that we are going as far as we can in the line of compensating. We have old gentlemen occasionally drop into the Department and say, "I have been reporting for your Department for twenty years." They become very useful men; they become very intelligent men. They get to learn how their estimates in the past sized up to the returns, and they become quite well-informed men.

I will not take up your time very much longer.

Mr. GRAFF: You think their experience is worth something.

Secretary WILSON. They are experienced men, every one of them, They are high-toned American citizens. They are not only farmers but people of all those other classes that I have mentioned, and they are proud of their positions, and when they get a Yearbook, and nobody else gets one, they say, "I earned that by my work;" and when they get a Crop Reporter they say, "That belongs to me;" and our intention is that the Crop Reporter shall give them information to strengthen them. They are going to school, as it were, Mr. Chairman.

Mr. SMITH. Could they be kept, and do the same thing with the same efficiency, if they were under the Bureau of the Census?

Secretary WILSON. That question has come up to me.

Mr. SMITH. That is the real question that we want to consider.

Secretary WILSON. The real question is whether you can turn my people adrift. In Washington there are 70, and outside of Washington there are State agents, and so forth, and the whole force amounts in all to 120. The question is whether we can cut adrift these 120 men and give the work to the people in the Census Bureau. I have always talked frankly with you gentlemen, and never concealed anything, and I believe now that one of the considerations underlying this inquiry all along the line, wherever it has been made, is to get something to do for a lot of gentlemen in the Census Office who have very little to do now. And the real question is, can we turn adrift our people and put in the other gentlemen?

The CHAIRMAN. The main question before us is the feasibility of this transfer, and of having one central statistical bureau for the United States Government. That is the point upon which the committee wants your judgment, whether it is feasibie so far as your Department is concerned.

Secretary WILSON. I will answer that just as soon as I come to it, if you will permit me to proceed.

The CHAIRMAN. In your own way, Mr. Secretary.

Secretary WILSON. A word as to what is done with all this matter when it comes up here, and with regard to the integrity of our work:

> The determination of the official figures is made by the Statistician, the ultimate averages of all the more important crops being worked out behind closed doors during the two or three hours immediately preceding the time appointed for their publication, and during the time when the Statistician is engaged on this work no one is permitted to enter or leave his room.

I would like this to go into my remarks. He could not leave the room himself to give out information. He does not know what is in these reports—because he does not open them until he gets them—except the reports from the townships and the counties, and these are so voluminous that they could not be worked out in three hours.

Up in our building we have the townships tabulated on one side of the hall, and the counties tabulated on the other side of the hall. But the reports from the State agents, the reports from the traveling agents—I have not mentioned them, but they are gentlemen who are paid, high-priced men, who travel all over the United States and overlook all this work and make special reports to the statistician—are not opened until the last few hours, after the doors are locked. Therefore, it is impossible before those reports are opened to know what they are going to show.

The statisictian brings in several expert clerks, and he says, "No one will leave this room until we make these calculations," and the secretary gets possession of his report. So that he does not know, and no one knows until final tabulation, what the result will be. It would require recourse to methods beyond my comprehension to give out any information with regard to our report under that system before it reaches the public.

Now, come back to the question of whether it could be as well done elsewhere as it is now in the division. That is to have estimates made, you mean? You mean to have estimates made about the crop by the Census Office before the crop is moved? Is that what I am to understand?

Mr. SMITH. Yes, sir.

Secretary WILSON. The Census people would then have to go further than they have gone yet. They make visitations from house to house in taking the census, and from ginnery to ginnery in getting ginnery returns. We, with our seven sources, comprising 250,000 people, make estimates of the crops before there has been any weighing or measuring or moving of them, for the benefit of all classes of the community.

The CHAIRMAN. That, I suppose, is based on the acreage—first on the acreage—and then you take it from week to week, as the weather goes on?

Secretary WILSON. Acreage is fundamental.

Secretary WILSON. I believe this is what Mr. Hyde does when he gets the door locked and those reports before him and those efficient clerks with him. It comes up finally to him. Within three hours what the State agents have got to say is ready for him and is placed before him, and what the traveling agents, the high-priced men, have to say—they are not so high priced, after all; they get, some of them, $7 a day—is tabulated and placed before him, and what the local agents in the South have to say in regard to cotton is opened and tabulated and placed before him, and what the information is from the other sources, except the counties and townships, is prepared there and placed before him. Then it comes up to the statistician. Now, here is the first difficulty that gentlemen of the Census will meet. Mr. Hyde's people have made their reports for a long time. Take the traveling agents, and the State agents, and the local agents, and so forth; they base their reports to a considerable extent, Mr. Chairman, on the value that they have learned to place on the individual reports to them. Here is a man from a county who has hit it so close, his returns have been so valuable, that they must rate that information that comes from him very high. Here is one who has been a little off, and he can not be rated so high.

Now, it all comes up to the statistician. He makes his estimates on the value of the men who made these figures, as determined by him from his correspondence with them in the past. This thing has grown up in the minds of all these trusted agents of ours, and it has grown up in the minds of our statisticians here, the idea that certain men—I can name some of them—men in several States, State agents, make their estimates so very close every year that nothing disturbs them in the future.

Now, when he takes up the list of State agents, the statistician will say "here is one" and "there is one; that man is always close," or "this man is always close," and he puts more weight there, on these men. He has that difference in his mind in regard to the present and the past, and your new bureau, your new gentlemen who are proposed to take up that work, have not got that. There is no comparison between present and past reports, no growth in the minds of these new gentlemen with regard to past and present.

Mr. SMITH. Why not transfer these same men to the Census Bureau?

Secretary WILSON. Then what would be the object, if you keep all my men? The primary consideration, as I have understood it, is to have the work done by fewer men.

The CHAIRMAN. And to prevent duplication?

Secretary WILSON. To prevent duplication.

The CHAIRMAN. It is not a matter absolutely of dollars and cents.

Secretary WILSON. There is no duplication in this Government with regard to agricultural statistics; not a particle.

The CHAIRMAN. How about the cotton estimate just finished by you and the Census Office? That is absolutely a duplication.

Secretary WILSON. There is a striking difference.

The CHAIRMAN. Almost absolutely alike. There is 7 per cent difference.

Secretary WILSON. It is several hundred thousand bales; no small matter.

The CHAIRMAN. That is right. Which will the public believe? There is the difficulty. If you have two sets of people doing absolutely the same work, that is the difficulty.

Secretary WILSON. Yes. If you will pardon me, both of us in that case went to a source where they have exactitude; but they have not had the time in that office to get all the ginners. But if you have not got the ginners, you have to make an estimate, and you have got to make an estimate of the cotton not ginned.

The CHAIRMAN. That is so with all crops. You have to make an estimate of the cotton not ginned, and of the wheat in the hands of the farmers.

Secretary WILSON. Yes; but I am trying to impress on the committee the growth of what has come to be reported to-day as compared with what has been reported by individuals in the past. These men have become experts along that line, and the census people have never undertaken anything of that kind.

The CHAIRMAN. Your man Hyde is a graduate of the Census Office, really, is he not? You took him from the Census Bureau ten years ago?

Secretary WILSON. Yes; but he has become a statistician in the last six years. You can not compare the work of the last census with that of the preceding one intelligently enough to find out how many cattle there are in the United States.

Mr. SCOTT. I suppose you will acknowledge that if in your Bureau and in the Census Bureau you have separate estimates of the cotton crop, and those estimates differ materially, the result will be that the people will lose confidence in both of them?

Secretary WILSON. No, no, no. They have our past record.

Mr. SCOTT (continuing). I think what this committee wants is your suggestion as to how that can be prevented. How, if we think that it is not wise to take the Statistical Division out of your Department, we can prevent this conflict of estimates.

Secretary WILSON. I will tell you how you can prevent that.

The Division of Statistics has not been evolved and developed and strengthened under your hands and mine in the last few years, because this question was pending. Since I have been Secretary of Agriculture, a half score of the best trained men we have had have been taken away at higher salaries. There is but one man in the division that I would trust to-day to take charge of that division as chief in the place of Mr. Hyde, and that man got an offer by telegraph the other day of $3,000 to go to Minneapolis.

Now, you have helped me to keep strong men in other bureaus by giving them higher salaries. There is no complaint now in other divisions and bureaus. For instance, in the Weather Bureau, those gentlemen know that if they are efficient and industrious and behave themselves there is a better chance for them in the future. It is the same thing in the Bureau of Forestry and the Bureau of Soils, and all the others; but no hope has been held out to the people in the Division of Statistics. My advice is this, that this thing should be evolved into a bureau, so that we can reach out for crops that we have done nothing with yet, and that you should put it in my power to get a few strong men to take the places of those men the division has been losing; and then there will be no duplication, because the Census Bureau has never done this kind of work, and there is no occasion for putting them at it.

The CHAIRMAN. The Census Bureau has heretofore been only a temporary bureau to take the census. Now it is made a permanent bureau.

Mr. SMITH. And it has begun at once to estimate crops.

Secretary WILSON. In the last three years it has been giving you reports with regard to ginners, and the difference between its reports in the last three years and our reports was 1 per cent and a fraction. That shows you that if they are absolutely correct we are very near it. That is the point. It shows you that we have been very near correct in our system of estimating.

Mr. SMITH. If, last October, the Census Bureau presented a report of the cotton crop of 1902, the current year, reporting the amount of cotton that had already been marketed and estimating the total crop that might be expected—that was in October, Mr. Secretary—at the time when your estimates also came out——

Secretary WILSON. Our last cotton report came out December 3.

Mr. SMITH (continuing). And the Census Bureau then presented another estimate in December based on what had passed through the gins and the judgment of their correspondents as to what remained in the country——

Secretary WILSON. The census report was on January 5, a month later.

Mr. SMITH (continuing). Now, does not that seem to be an exact duplication of the estimates that you have been making?

Secretary WILSON. No; the two reports vary several hundred thousand bales, and we reported a month earlier, while the crop was in the hands of the grower.

Mr. SMITH. I am not questioning the accuracy of your report as compared with that; but is it not a duplication?

Secretary WILSON. We are too far apart for that; the results vary, while the source of information is the same, and I think that we are doing it as well as it can be done.

Mr. SMITH. There has been no complaint of the work of your Department until this friction has arisen between you and the Census. There has been no complaint by the public of the work of this Division of Statistics.

Secretary WILSON. No, sir; no complaint on our part; we desired to continue our work as we have been doing it. I have some letters here to which I would like to call your attention, showing what the public say. Here is a letter from Dr. Wiley to Mr. Hyde.

He wants help in getting up some statistics. And that is the case with all of our divisions. I want to call your attention to the fact that the division of statistics in the Department of Agriculture is an absolute necessity to-day, and every division and bureau and office depends upon it, and none of them can get along without it. You move that division of statistics over there, and let me show you what you will move. I asked the question of the librarian what special features there are there. That is their working library which we have there. I said: "Tell me briefly what you have and what is the use of it? I want to get at it, so that I can put those facts before the Agricultural Committee of the House." There is the finest library of statistics there in the world—a library of over 12,000 volumes.

The library of the division of statistics, besides containing a large number of books of reference essential to the purposes of such a library, is especially well equipped in the following:

1. Annual reports of the boards of trade and produce exchanges of the principal commercial centers of the United States, covering, for some cities, a period of upward of forty years, and believed to be the most complete possessed by the Government.
2. Annual reports of the different State boards of agriculture containing statistical data and general information on the agriculture of individual States. These sets in many instances are complete from the first issue to date.
3. A complete file, for a long series of years, of the daily price list sheets published by boards of trade, produce, and cotton exchanges, and giving daily prices, daily receipts and shipments, visible supplies, and other valuable statistics upon agricultural products and live stock—a more complete file than is possessed by any other Executive Department.
4. Almost complete sets of United States Treasury, Census, and other Departmental reports necessary to the work of this and other divisions.
5. Annual and other statistical reports from foreign countries, giving statistical, commercial, and agricultural information, and used not only by the division of statistics but by other divisions and Departments.
6. Files of the leading statistical and economic periodicals of the United States, England, Germany, France, Italy, Argentina, Russia, and other countries.
7. A card index of over 44,000 cards concerning the agricultural and statistical literature contained in the library.

Employes and officials from other divisions and Departments constantly consult the index, files of books, price-list sheets, and journals, notably among these being employees of the Census, Bureaus of Soils, Chemistry, Plant Industry, Forestry, etc.

Several thousand requests are annually sent to the statistician by boards of trade, editors of periodicals, scientists, compilers of statistics, crop reporters, etc., for information which can only be answered by consulting reports contained in the Library of Statistics.

Now, gentlemen, you take away these people and you have got to take that library or they can not do as good work. And if you take it we can not do as good work without it. The Department of Agriculture, with its several bureaus and offices, is dovetailed together, one division with the other, as one part of a building is dovetailed to the other by the overlapping and interlacing of the bricks.

It is built up as a whole for future interdependence. I called on one of the officers, Mr. Holmes, and told him that I wanted to know what work was being done in the Division of Statistics for other bureaus and offices in the Departments. He says the following is a statement of the work done by the Statistical Division for the various bureaus and divisions of the Department of Agriculture (reading):

> 1. Compiles all statistical matter, both domestic and foreign, for the use of the Secretary and other Department officials, in replying to their voluminous correspondence with regard to agricultural matters.
> 2. Prepares all statistical matter for the Yearbook of the Department of Agriculture.

That is required by law. Of course you can take the Yearbook out of the Department of Agriculture and put that in the Census; but do you see what you are doing when you do that? The Yearbook of the Department of Agriculture is the best exponent of the scientific work of the Department that has ever been published. It is the index to what we are doing, and there is nothing like it. That will have to go also. There is no place where you can stop. It is like taking apart a man and trying to make two men of him. You can not split up our work without injuring the whole Department. (Reading:)

3. Maintains a library of domestic and foreign statistical publications for consultation by the various scientists and clerks in the Department.

4. Maintains a corps of about 250,000 correspondents for the use of the different bureaus and divisions of the office.

5. Sends special inquiries to these correspondents at the request of different bureau chiefs.

I have something here which is very interesting on that point, exceedingly. They had a great flood down in Mississippi, and the Division of Statistics was called upon at once by the Bureau of Plant Industry to say how many farms were submerged. We have got it all here—how wide an extent of country was included in that flood.

We wanted to know, because we wanted to help those people to grow another crop. And we did. The Division of Statistics had all the information, and nobody else had it. Now, if you take that Division of Statistics away, and put it in the Census, we can not answer such an inquiry as that. (Reading:)

During the past year the Division of Statistics has done special work through its correspondents for the Bureau of Forestry, the Bureau of Plant Industry, the Bureau of Chemistry, the Bureau of Soils, the Office of Experiment Stations, the Division of Entomology, and has recently sent to its correspondents a schedule on land tenure.

Why did it send that on land tenure? I can tell you. In certain parts of the United States the wheat crop is decreasing, notably in California, notably in the old wheat-growing regions. I wanted to know the conditions under which agriculture was being conducted that led to the deterioration of the wheat crop. I wanted to know the extent to which the farms were being turned over to tenants, and the extent to which wheat was being grown as a sole and single crop. I wanted that information gotten up.

My view with regard to the future of the Division of Statistics is not only to give the figures with regard to these crops, but I would like to have specialists in there of such ability that they could take up subjects of interest to the whole nation and write bulletins on them for the benefit of our whole people. (Reading:)

6. Prepares special bulletins on statistical matter at the request of the Secretary. [Sample herewith.]

7. Makes special investigations of damage caused by floods or other unusual conditions.

There was a flood in Texas not long ago. Our statisticians could tell us at once the extent of country covered, and how many farms were there, and how much it would require to seed a new crop for those people in the Brazos Valley.

Mr. SCOTT. You understand, of course, that there is no proposition to absolutely do away with this statistical work, and as you go along I would like to have you suggest to us in what way it happens that your Department can do it a great deal better than the Census, for instance, could do it. You speak of the Bureau of Soils asking your Statistical Bureau for certain information. Would it be very much more trouble for your Bureau of Soils to go across town to get that information instead of across the hall?

Secretary WILSON. Suppose, for illustration, one of you is a father and has a little girl in your family, and the trustee of the town comes and says to you, "We have got to look into the question of economy, and, at the same time, the question of efficiency. This child of yours must be well fed and warmed and clothed and properly instructed. We have a foundling institution across the street here with just as good a roof on it as your roof and just as good a furnace in the cellar. We have studied the question of nutrition there, and we know how properly to feed and clothe and care for children. Now, what reason have you to give me why I shall not take that little girl of yours and put her in that foundling institution? You could hear from her by correspondence." Well, I am afraid when it got along about evening she would miss her mother. I am afraid she would be homesick; and then her mother wants her at home.

You are proposing to put agriculture, gentlemen, under commerce; under manufactures, that are the offshoots of agriculture. You are putting the cart before the horse. If you want to economize, send me the Bureau of the Census, but do not ask us to wait on the convenience of some person who may, and in fact must, in the future, think a great deal more of commerce and manufactures than of agriculture. We would want far more work done than all other departments put together.

The CHAIRMAN. Why should you presume that? Why is not commerce and manufactures just as much entitled to correct satistics as agriculture?

Secretary WILSON. I assume that you are getting it for them now. The proposed department of commerce is expected to do for that industry what my Department does for agriculture. I have no objection to that.

The CHAIRMAN. Why should you assume that the trend of prejudice in the Census Bureau would make them more favorable to manufactures than to agriculture?

Secretary WILSON. They have to look after commerce and manufactures, and ours would be secondary.

The CHAIRMAN. They would look after everything.

Secretary WILSON. The man who is put at the head of the new department will know that if he makes any reputation he will have to make it in the line of commerce and manufactures. He will not be in touch with agricultural matters. It will be like the calf sucking the cow through the fence. [Laughter.] You will simply injure the Department of Agriculture by taking away what we need all the time. You will injure and weaken the rest of the bureaus and offices in that Department.

I will give you an illustration. I want certain information for the use of the Department, and I send a respectful request up to Director Merriam, who is a very pleasant gentleman—I do not want to speak at all lightly of any of these gentlemen; I am speaking of the proposed two-headed system. I send up there, and I say "I want so and so, and so and so," and he returns a respectful answer, as he surely would, and he says "As soon as I can get around to it, I will let you have the information."

The CHAIRMAN. Everybody knows that the Census is in its infancy. Nobody thinks that they are very efficient; they are just starting—

Secretary WILSON. Conceding that, why injure a system that works well now? A Congressman writes me a letter asking for certain information. I tap the bell and I say, "I want that information at once. These Congressmen legislate, and they must have this information promptly." Gentlemen, up there it might be different. I can control the sources of information in my own Department. But I can not go up there and say to the Census Bureau officer, whoever he may be, "Who are the people who will get this information for you to send to me?" I can not do that. That would be impudence on my part. "I would like to get hold of them and set them at work at once." He would give me to understand that that was his jurisdiction, and he would be right. When I want a thing done quickly, I say "rush;" that is more than I could say to him.

This is a thing that we lean upon and depend upon all the time. We will miss it if it is taken away. It will be one of the cogs out of the wheel. If it is taken from us it will be a brick out of our wall. And really we would have to go to work and build it up again; as it would take them years to become as efficient as we have our men under our system. I want to know everything that is being done. I want to decide the direction in which it shall go. Otherwise you would not have had the growth that you have had. I am a farmer, and always have been, and my sympathies are with the farmer, and always will be.

I never lived in a town a day in my life except when I was sent there by the people to do something. There is the question. My sympathies are with these people working down in the Southern fields—it may be a barefooted man working with one mule to raise a little cotton—or in the far North reclaiming the burnt-over district, or on the Pacific coast, or the wheat fields of the West, or the reforesting of waste places. My sympathies are with these people coming from Finland into the States of Minnesota, Wisconsin, and Michigan. My sympathies are with every American farmer. I want to strengthen those poor people, the Scandinavians and others, going in there and trying to make a living, and to recuperate the waste places of our land under our own flag. That is the reason, sir, why it is not wise to tear anything out of the Department of Agriculture that you have built up. But, on the other hand, I turn to you now to aid the good work that you have done for the Department of Agriculture, to continue it, and to give me the assurance that I shall get more strong men, and I will take the first steps toward reaching out and giving you more prompt and better work than has been done in the past, and what is being done now should have been done long ago, and what we are doing has general approval.

I think, unless there are questions to be asked, that is all that I care to say. I have a lot of papers here, and some of these I ought to call your attention to, I think. They give you an indication of the sentiment of the people outside. There is a letter here from the New Orleans people, the cotton people down there. They want the division continued where it is. Here is another from Mr Harvie Jordan, president of the Southern Cotton Growers' Protective Association. He wants the same thing. Here is one from the New Orleans Cotton Exchange, desiring that the division be left where it is.

And we have them from New York and from all over the United States. I will give you simply the names appended to those letters I have here: William V. King, superintendent New York Cotton Exchange; Charles A. Wieting, commissioner of agriculture of the State of New York; G. D. Rogers, secretary of the Chamber of Commerce, Minneapolis, Minn.; B. W. Kilgore, secretary Cotton States Association, and Henry Hawkins, secretary of the Board of Trade, Shreveport, La. These are from the business men of the country. They have confidence in our work and want it to continue where it is.

Mr. **Graff**. Do you know the method pursued for collecting these statistics in Germany and England and the principal European nations?

Secretary WILSON. They are similar to ours.

Mr. GRAFF. Do they have a general statistical bureau which is outside of the different departments, similar to the Census Bureau?

Secretary WILSON. I wish you would ask that question of these Board of Trade men, who will follow me. I have an opinion about it, of course; but it is their business to know about it.

The CHAIRMAN. I called at the German embassy yesterday to find out how they did it in Germany, and I found that the data are all gathered by the different departments. For instance, the department of agriculture will gather its data, and they are sent to the central statistical bureau, which digests them, and that information is then sent out by it. That is my idea of what ought to be done with us.

Secretary WILSON. That is substantially what we are doing now.

The CHAIRMAN. I think that is the proper way to do it, and that will stop duplication of the work.

Secretary WILSON. That is substantially what we are doing.

The CHAIRMAN. No, sir; you do not send your data to a central Government bureau of statistics, and you tabulate and work it all out yourselves.

Secretary WILSON. No, nobody could do it as well as we. The Germans and most other foreign peoples are sending their men here to ascertain how the Agricultural Department does its work, and we can not afford to follow them. No foreign country begins to do for agriculture what we are doing. All of them know this and are inquiring into our methods.

The CHAIRMAN. I have always considered the Germans pretty thorough in anything that they undertook, and——

Secretary WILSON. Yes, they are. But they are sending 40 men over here this year to find out about our methods in addition to keeping an agricultural attaché here all the time.

Mr. SMITH. They are preparing to follow us?

Secretary WILSON. Yes, they are. They have got our publications, and they know what we are doing.

Mr. SCOTT. When the suggestion is made that the Census Bureau would have no such force of correspondents as you have, it has been answered that your correspondents might be turned over to them; and when the objection has been made that there would be no way to pay those correspondents, the suggestion is made that they might be paid as they are now, through the seeds and documents. What would be your idea as to that?

Secretary WILSON. You mean have us pay the workers of the Census Bureau, and encourage them along to send reports in to the Census Bureau? It would be helping agriculture by indirection. My idea would be that it would be much better to let them stay where they are in immediate touch with our work. They would work with a much better will, I think.

Mr. HAUGEN. You state that you employ a number of high-priced men. How many are there of those?

Secretary WILSON. Six, I think.

Mr. HAUGEN. It was stated by the Director of the Census the other day that he also employs a number of these men to gather statistics. Would it not be well to arrange with you that these men should do the same work?

Secretary WILSON. He has never done the same kind of work that we are doing, giving estimates. I understand if this change is made the pay system will prevail.

The CHAIRMAN. He stated that under the direction of the law he now has a county official reporter in every county in the cotton belt.

Secretary WILSON. Yes; a paid man. We have many volunteers in each county.

The CHAIRMAN. A paid man, and they get the reports on which the estimates are based.

Secretary WILSON. We have a great many in every county, not paid.

Mr. GRAFF. What preparation do these special agents have who are paid $7 a day?

Secretary WILSON. They are generally trained in the Department by our trained scientists, just as other scientists are trained.

Mr. GRAFF. Along the lines of agriculture?

Secretary WILSON. Yes, sir.

Mr. HAUGEN. Do you keep them all the time?

Secretary WILSON. Yes, sir; all the time.

The CHAIRMAN. Getting information?

Secretary WILSON. Getting information from the field, or from railroads or from manufacturers, or something of that kind.

Mr. HAUGEN. Are the same ones employed in the same places for that work constantly, or are they changed about?

Secretary WILSON. They are changed about sometimes.

The CHAIRMAN. Do you pay them a salary or a per diem?

Secretary WILSON. A per diem.

The CHAIRMAN. Why not make them permanent, and give them a certain pay?

Secretary WILSON. If they miss a day now, they lose their pay.

The CHAIRMAN. Do they ever miss a day?

Secretary WILSON. Yes, sir; they do. And they do not get their thirty days annual leave or sick leave. You may smile at me on the idea of economy, but we have never had more than $14,000 for this work, and these letters show that the gentlemen interested outside of the Bureau are all satisfied, and do not want you to disturb it by organizing a paid force of quite different people.

Mr. GRAFF. How near have the estimates come in past years; they have come quite near to the actual condition as afterwards developed, have they not?

Secretary WILSON. Quite near; quite close. You see, you never would get the actual statistics in regard to a crop unless you were going to weigh it. That is never done by anybody. We get what the Census calls "actual facts." They are no such thing. They are intelligent guesses by intelligent, good-natured farmers. We have seven sources from which to study the guesses of those farmers.

Mr. LAMB. Of this $14,000, how much is spent in the field, and how much in the Department?

Secretary WILSON. A large part of it is spent in Washington, compiling and getting up these reports.

Mr. HAUGEN. The Director has already explained that that work could be done better in the Census Department, inasmuch as they employed paid statisticians.

Secretary WILSON. Now, I do not believe that a paid statistician, who goes there to earn so many dollars, will give you any better service or as good service as the farmers and bankers and millers who now report to us.

The CHAIRMAN. On what do you base that statement—in your judgment?

Secretary WILSON. On my experience, because I know and have come into contact with a great many of those men. They are proud of their work, and make a study of it, and they are very intelligent men all along the line, and any amount of money that you might give them would not change them. But if you paid money for this service you probably would not have those men, but a different class.

The CHAIRMAN. Politics would get into it?

Secretary WILSON. Probably. I think it has been at work a little already.

Mr. GRAFF. You give as a particular reason for retaining this Bureau in your Department that these men are adapted by training or experience for this particular line of work—agricultural work?

Secretary WILSON. Yes, sir; they are specialists in agriculture, and if you double up the work of agriculture with that of commerce and manufactures, then you are mixing men up and generalizing instead of having specialists.

Mr. LIVINGSTON. When a farmer reports the amount of cattle, and the railroad and the banker reports it, and the speculator reports it—and you have some of them on your list—when you come to tabulate, how do you compromise the differences?

Secretary WILSON. That is what I have been speaking of. That is the value of a continuation of a scientist in one line of work. When the tables all come to one man, two or three hours before they come to me finally, he takes up all those sources on which he gets information, and compares those reports from each source with the one of the year before, and the one of the year before that, and so on back. He has an idea in his mind of the value of the reports from these State statisticians and from these traveling agents and others, because he has had experience with them before, and he puts the most weight on the report of the man who has made the best record.

Mr. LIVINGSTON. He exercises his judgment?

Secretary WILSON. He must. There is no other way under the sun to do it.

Mr. LIVINGSTON. And the estimate is not based on the figures that he gets from any particular department or field, but he exercises his judgment?

Secretary WILSON. He puts the weight on all the seven sources from which he gets information, and the record shows that he has been quite near the truth. The figures he gets are the basis of his estimates.

Mr. LIVINGSTON. I understand.

Secretary WILSON. He puts weight on those seven sources; but the source or the man which has been the most reliable in the past, he gives most weight to.

Mr. LIVINGSTON. What is that source?

Secretary WILSON. I will name the seven sources.

Mr. LIVINGSTON. Which is the most reliable, I say.

Secretary WILSON. In one State there are several correspondents, the township men, the county men, the State agents, and so forth. There are seven sources. They vary, but the average is the best in the land. When it is all done it is done by human beings that are liable to err. But when it has been done by these different sets of men you are liable to get a pretty close average, and they do. No one source controls. One is a check upon all the others, and continuous comparing year after year enables the statistician to give weight judiciously.

Mr. LIVINGSTON. You reported the round bale, which is only 263 pounds, as a whole bale of cotton.

Secretary WILSON. No, sir; we reported two as one.

Mr. LIVINGSTON. You do not show it in your report.

Secretary WILSON. I show it in my report.

Mr. LIVINGSTON. Two as one?

Secretary WILSON. Yes, sir.

Mr. LIVINGSTON. Mr. Hyde did not show it in his.

Secretary WILSON. He probably did not think to make a footnote about it; but that is what is done.

Mr. LIVINGSTON. It is?

Secretary WILSON. Yes, sir.

Mr. LIVINGSTON. Are you aware that from whatever source you may get your estimate as to a growing crop of cotton, it is merely a guess, even with the farmer, do whatever you please?

Secretary WILSON. I am trying to impress on this committee that when the census enumerator goes to the farm he only gets a guess, and the guess of one man.

The CHAIRMAN. Have you any doubt as to whether it is a Government function to make an estimate, anyway?

Secretary WILSON. There is the law; I am endeavoring to carry it out.

The CHAIRMAN. I know that you have been directed to make an estimate, but I wanted your opinion.

Secretary WILSON. Crop reporting of all kinds is estimating. I am very much obliged to you for this hearing.

STATEMENT OF MR. WILLIAM S. HARVEY, OF PHILADELPHIA.

The CHAIRMAN. Please state whom you represent.

Mr. HARVEY. Mr. Chairmen and gentlemen, I am president of the board of trustees of the Philadelphia Commercial Museum, which is one of the institutions which is known throughout the country, and also abroad, as gathering information for the benefit of the American producers and American manufacturers, and is becoming a sort of clearing house between the American producer and manufacturer and the foreign buyer. We have 120,000 home and foreign correspondents.

Mr. ALLEN. May I interrupt you for a question?

Mr. HARVEY. Certainly.

Mr. ALLEN. Is that an incorporated institution?

Mr. HARVEY. No, sir; it is an association which is chartered by an ordinance of the city of Philadelphia. It is in part a bureau of the city of Philadelphia, and receive support from the city of Philadelphia and also from the State of Pennsylvania, and it also received several years ago $350,000 from the General Government for buildings.

The museum now possesses property valued at nearly $3,000,000.

It is a commercial museum, for the development of commerce, and has a bureau of information that furnishes information to American manufacturers and producers without cost to anyone who may inquire. It has a number of subscribers, whose subscriptions in part support it.

Mr. ALLEN. It is not a State institution, made so by law, but it merely receives voluntary aid?

Mr. HARVEY. It receives support from the city of Philadelphia and the State. The governor of Pennsylvania, the mayor of Philadelphia, and the president of select and common council, and the president of the school board are members of the board of trustees, also 14 well-known and influential gentlemen, all of whom serve without compensation, giving of their time and means for what they believe to be the public welfare.

I am also chairman of the committee that was selected by the National Board of Trade to investigate crop statistics as reported by Departments of the United States Government.

The other gentlemen who are associated with me on this committee, three of whom are present, are Charles B. Murray, of Cincinnati, secretary of the Cincinnati Chamber of Commerce, and also the editor of the Cincinnati Price Current, which is known all over the world as the most reliable statistical paper in the United States; and I would like to say, as you may not know Mr. Murray, that he was one of the first American citizens honored by a banquet by the Board of Trade of Liverpool, twenty-one years ago, as an evidence of their appreciation of the work that he was doing, which was recognized as being of great value and reliability by the Board of Trade of Liverpool and other foreign boards of trade and bourses.

Mr. J. C. Brown is the statistician of the Produce Exchange of the city of New York, and has been for seventeen years. Mr. H. A. Wroth is assistant secretary of the Chamber of Commerce of Baltimore. These gentlemen are with me to day.

Mr. Howard, who has been the reporter of statistics of the Chicago Board of Trade for forty-one years, is also a member of this committee. Mr. Howard is unavoidably detained by illness.

The National Board of Trade had this committee appointed more than eight months ago on account of the criticisms that were being made in regard to statistical information furnished by various departments of the Government. Discrepancies, inaccuracies, and inconsistencies existed between the reports made by different departments. The committee met in Washington on the 16th of September, 1902, and took up their work at the Census Bureau and subsequently at the Department of Agriculture. I would like to say that while we came here as an impartial committee, without any prejudices whatever toward any department or division of the Government, not to deal with men, but to deal with measures in an impartial way, if there was any leaning in our minds that leaning was rather adverse to the Department of Agriculture.

The committee's report was made public in November. It was presented at the National Board of Trade annual meeting yesterday, where 52 chambers of commerce and boards of trade were represented, from California to Maine, and it was unanimously adopted and a resolution passed that the committee of inquiry should be continued.

I would like to state, Mr. Chairman, that everything that is presented by this committee is the unanimous work of the committee; it is not the work of any single member, but the report has received the unanimous indorsement of each member of the committee.

The question may naturally arise as to why the committee of inquiry in regard to agricultural statistics is present before the House Committee on Agriculture, to which it is proper to say that since the submission and promulgation of the inquiry committee report there have been various statements made in the press and also before the House Committee on Agriculture which reflects an intent on the part of certain parties to discredit the report of the inquiry committee in some of its important statements, which committee has given to the public the result of an investigation which its members were called upon to make, and in the work or results of which there were no elements of self-interest. In coming before your body the aims of your committee in the interest of betterment of important governmental service is fully realized, and with a wish to be helpful, if possible, in the good work you are endeavoring to accomplish.

The inquiry committee report was the result of proceedings which had no purpose to serve but that of investigation and report strictly in the public interest, and without partiality toward either of the governmental offices under consideration. The report has been carefully considered by the committee in all its particulars, and reflects in each and all of its features the declared views and decisions of each member of the committee. So far as known, no comment of significance of unfavorable nature has been made in regard to the findings of the committee excepting in one particular, while many expressions in recognition of the value of the work performed have come to the notice of the committee. The one particular referred to relates to the statement concerning the features of inconsistency in the Census Bureau work found in comparisons of area.

Mr. Chairman, I would like to here, if I may take the liberty, reply to a question which you asked the honorable Secretary of Agriculture, "if the basis of their crop reports was not the acreage area." On page 13 of the inquiry committee's report we state, "the errors in crop statistics of the Department of Agriculture appear to have been due more to a faulty area basis than to any other cause."

Under date February 23, 1901, Director Merriam issued Census Bulletin No. 57, and over his signature the introduction contains these words:

> This bulletin, prepared under the direction of Mr. Henry Gannett, geographer, presents in the subsequent pages tables showing the area in square miles of the United States by States, Territories, and counties.

This is a Census Bureau report, duly presented. The inquiry report feature which has received unfavorable comment from officials of the Census Office reads as follows:

> Features of inconsistency in the Census Bureau work are to be found in comparisons of area, in instances where the agricultural returns make the farm areas equal to or exceed the land surface, according to survey records as presented by the Twelfth Census. There appear many such instances. In 20 States, in which there are 1,490 counties, there are 101 counties made to appear as having farm lands equal to or in excess of the entire surveyed land surface. This number includes a few which by a small fraction of 1 per cent are under 100 in the comparison, but which practically represent the entire land surface.
>
> The excesses over an equal extent of area range up to 40 per cent, the aggregate number of acres indicated in the farm returns of these 101 counties being 5 per cent greater than their entire surface, without allowances for highways, towns, railroads, etc. Of the 101 counties there are 69 which appear to have more farm acres than the surveyed land records indicate within their boundary lines. There are 23 having over 5 per cent excess of such area; there are 13 having over 10 per cent of such excess, 10 having over 15 per cent of such excess, 8 having over 20 per cent of excess, in comparison with the reported actual land surface. For Ohio, 19 per cent of the number of counties are shown to represent 100 per cent or more of the entire surface as in farm lands; in Iowa, 17 per cent; Kansas, 12 per cent; Kentucky, 9 per cent; Missouri, 9 per cent; Tennessee, 6 per cent; Indiana, 6 per cent, etc.
>
> In addition to these 101 counties found by analysis of Census Bureau data to reflect returns of farm lands equal to or in excess of the surveyed land surface of such counties, there are 700 other counties showing 90 per cent or more, of which 335 represent 95 per cent or more, in such comparison. Thus over 28 per cent of all the 2,800 counties of the country represent farm areas reported as 90 per cent or more of the surveyed land surface.
>
> Whether these conditions, reflecting a large extent of farm acreage in excess of what can be accepted as the true position, are due to overestimates in returns of enumerators, or to duplications in the mechanical operations incident to the methods of the Census Office in the tabulating work, or to both of these, with inconsistent work in editing the schedules, and other causes, can not be stated by the committee, but they are evidence of erroneous work, the measure of which in influence on results can not be satisfactorily estimated.

The report has not undertaken to declare what is or what is not erroneous in these particulars—simply to point out inconsistencies, which can not be set aside by any effort or pretense at explanation. Any explanation that implies removal of these manifest inconsistencies in the work of the Census Office must necessarily depend upon declarations implying errors in this official work submitted for the acceptance of the public. We are not here to make declarations as to errors, but as to inconsistencies, and inconsistencies necessarily imply imperfect work.

To declare that the data of a particular county, or set of counties, or of a State, have been retabulated and the results found to be consistent with the first tabulation does not imply accuracy of the conclusions reached, for the returns of enumerators, upon which these results are based, may be seriously faulty, and responsible in fact for the inconsistent or erroneous conclusions, but which are not removable or explainable by any statements which have been or can be presented.

In the report of Director Merriam's statement before the Agriculture Committee, he is quoted as saying:

> Of the 102 counties in which it is alleged that the reported area in farms is greater than the entire land surface measured by the geographer, 56 are disposed of by the report of the geographer who finds the statement regarding them entirely erroneous.

That is to say, the farm area of the agricultural census is not in excess of the total area as reported by the geographer.

To this it may be replied that the census reports of land areas show 70 counties, which represent an aggregate of 21,845,120 acres of surface, including highways, railways, towns, etc., while the farm reports of the Census Bureau represent 23,543,025 acres for these counties, in each instance the farm area being the greater, and the aggregate shows an average excess of 7¾ per cent.

Additional to these 70 counties there are 31 which represent 10,398,080 acres of surface, as compared with 10,400,287 acres reported as farm areas.

When the Census Director states that of the 102 counties alluded to by him 56 are disposed of by the report of the geographer, who finds the statement regarding them entirely erroneous, he makes a declaration that of itself is seriously inconsistent with the Census Office data, and can not be supported otherwise than by declaration or confession that the information published and promulgated by the office is in fact erroneous in either the geographer's report or the exhibits of the agricultural statistician, or both, and therefore necessarily supports the position taken by the inquiry committee. We submit herewith a list of 70 counties (marked "Exhibit A"), giving the land areas and farm areas of these counties, the latter being greater than the former in every instance.

The Census Director is reported as saying:

> Omissions of farm acreage have been more frequent than duplications.

If this be true, the more significant as an element of inconsistency is the Census Office evidence of excesses of farm areas in comparison with reported actual land areas for the same counties.

Our committee might go much further in pointing out the evidences of failure on the part of the Census Director to explain away the inconsistencies pointed out by the inquiry report, but the instances here mentioned are deemed sufficient to support our position as one which has not in any particular been disturbed by the labored efforts of the Census Director.

The understood object of the plans of the Government in expenditures for agricultural statistics is to furnish information of value to all interested classes, without preference or discrimination, and it is regarded as not too much to assert that no branch of the governmental service is of more importance than that engaged in presentation of agricultural statistics. This work has been performed by two branches of the Government, but under different methods and different forms. The census work has its elements of value, largely in the feature of data serving as comparison and verification, while the work of the Department of Agriculture has afforded a current guide as to conditions incident to the production, supplies, and distribution of crops. The Census Office in being placed on a permanent basis may strengthen and improve its work, but there is no visible ground for expectation that it could prosecute such work with a degree of efficiency and value equal to that reached in the statistical division of the Department of Agriculture.

The inquiry report presents recommendations which include the strengthening of the statistical division of the Department of Agriculture by giving it the power of a bureau, and the retention of this service in the Department, with some changes in methods in the statistical work. It is believed that recognition of these propositions would imply the maintenance and betterment of such work.

The recent comprehensive statement of the honorable Secretary of Agriculture under date January 5 well and clearly shows the importance of the work of the Statistical Division and reasons why, under the community of interests centered in his Department, it would be inadvisable and prejudicial to the general welfare to disturb these conditions. It is also demonstrated that this division as now located can perform the work which its office calls for more efficiently and more economically as to cost than can any other branch of service.

EXHIBIT A.

State.	County.	Acres in counties.	Acres in farms.	Farm, per cent.
California	Merced	1,236,480	1,702,967	128
	Orange	480,000	599,436	125
	Sacramento	640,000	668,426	104
Delaware	Kent	277,760	338,205	122
Georgia	Glasscock	60,800	73,358	121
	Rockdale	77,440	78,300	101
Indiana	Greene	308,480	332,759	108
	Hancock	185,600	186,830	101
	Newton	243,200	245,557	101
	Owen	243,200	246,748	101
Iowa	Appanoose	320,000	325,147	102
	Audubon	276,480	282,456	102
	Jasper	460,800	464,105	101
	Johnson	369,920	305,770	104
	Monona	276,480	386,780	140
	Plymouth	524,800	541,967	103
	Pottawattamie	560,640	599,930	107
	Shelby	368,640	371,873	101
Kansas	Labette	415,360	419,416	101
	Leavenworth	286,080	334,404	117
	McPherson	576,000	602,620	105
	Morris	432,640	473,633	109
	Osage	460,800	490,909	107
	Pottawatomie	537,600	556,541	104
	Riley	386,560	389,619	101
	Shawnee	350,720	353,945	101
	Wabaunsee	507,520	541,646	107
Kentucky	Bourbon	170,880	174,383	102
	Boyle	102,400	108,831	106
	Bracken	123,520	126,953	103
	Fayette	172,160	178,894	104
	Mason	130,500	142,690	109
	Montgomery	128,640	131,606	102
	Pike	486,400	506,010	104
	Scott	145,920	186,173	128
Michigan	Hillsdale	387,200	390,614	101

Exhibit A—Continued.

State.	County.	Acres in counties.	Acres in farms.	Farm, per cent.
Missouri	Caldwell	272,640	276,827	102
	Clinton	266,880	273,704	103
	Daviess	339,840	353,670	104
	Mercer	288,640	291,917	101
	Nodaway	552,960	556,122	101
	St. Charles	291,840	300,171	103
	Schuyler	193,280	198,530	103
North Carolina	Alleghany	142,720	145,200	102
	Ashe	255,360	272,137	107
Ohio	Brown	275,200	309,036	112
	Delaware	275,840	282,396	102
	Franklin	306,560	210,053	101
	Gallia	261,120	279,420	107
	Guernsey	309,760	323,993	105
	Harrison	236,800	247,933	105
	Highland	257,120	363,892	102
	Madison	288,640	294,853	102
	Monroe	275,840	281,464	102
	Morgan	253,440	260,760	103
	Noble	236,160	248,495	105
	Pickaway	303,360	309,642	102
Oklahoma	Canadian	513,920	519,335	101
	Pawnee	346,880	414,768	120
South Carolina	Spartanburg	487,680	551,149	113
Tennessee	Hamblen	105,600	107,071	101
	Marshall	201,600	229,482	114
	Trousdale	68,480	71,457	104
	Union	151,680	152,918	101
	Williamson	320,000	340,886	107
	Wilson	553,280	364,731	103
Utah	Davis	182,400	225,957	114
Virginia	Rappahannock	168,960	173,656	103
West Virginia	Berkeley	164,480	168,795	103
	Taylor	84,480	103,704	123

The Chairman. How do you account for that discrepancy in regard to the land? I suppose the census enumerator comes along and asks a farmer "How many acres have you got?" and he is a little prone to exaggerate. He always throws in the road, anyway.

Mr. Harvey. In our inquiry to the Census Bureau they endeavored to explain that if the farm extended into another county, the entire farm was counted in the county in which the man resided.

The Chairman. There was a double enumeration and a duplication of work?

Mr. Harvey. Yes, sir. In the minds of the committee the impression, to which reference has not been made, is that more farms are reported in some instances at 15 cents per farm than exist. Enumerators were also paid 4 cents for reporting mortality, and it was discovered that the mortality in some counties was reported less than it really had been, because they got better pay for farms than mortality.

I would like to state, for the information of the committee, that we have listened with very great interest to the statement that was made by the honorable Secretary of Agriculture this morning, and some of us who have had experience are prepared to indorse in the most unqualified manner the statement that he has made in regard to the character of the service he gets from the men who are interested in their work, it being superior to the service that can be paid for.

These men to whom he gives seeds and publications feel a pride in being identified in a measure with the Agricultural Department of the United States Government, and they render better service, and we know this in our experience of years in the Commercial Museum work. We pay for our service largely by furnishing and exchanging information. It is what you might term practical reciprocity. Mr. Murray, of Cincinnati, who is one of the best-known crop statisticians in the world, can testify what his experience has been. Mr. Murray could not afford to pay all his correspondents.

He has few correspondents whom he does pay, but Mr. Murray gets his service largely from men whom he knows in various counties throughout the principal crop-raising States; they furnish him with data and statistical information which enables him to keep tab on the work of the Statistical Division in the Agricultural Department, and he gets information in exchange for information.

I thank you, Mr. Chairman and gentlemen, very much for giving us this hearing. I presume that you would like to ask the other gentlemen some questions.

The CHAIRMAN. We would like to hear from Mr. Murray.

STATEMENT OF MR. CHARLES B. MURRAY, OF CINCINNATI, OHIO.

Mr. MURRAY. We have for many years, Mr. Chairman, been carrying on a regular work in a general way with reference to collecting current information, but we do not assume to offer precise statements as to conditions or quantitative exhibits from time to time, otherwise than to that extent that may serve as a sort of general guide to those who are interested in these propositions currently.

The CHAIRMAN. You do not employ a regular force of correspondents, do you?

Mr. MURRAY. No, sir. I have hundreds of correspondents to whom we send out inquiries. In regard to our method, I will state briefly that I have five lists of correspondents to whom I send inquiries, to list No. 1 this week, to list No. 2 next week, and No. 3 the next week, and so on around, until I reach the beginning again. In that way I distribute these inquiries over the various sections of the different States in which I pursue these inquiries, so that we get in each instance information from a distinctive locality as compared with that which precedes. And each of these lists of correspondents is different from the others and from different localities.

The CHAIRMAN. What is the total number of correspondents?

Mr. MURRAY. From 1,200 to 1,500 altogether at different times. I do not address that number regularly, only on occasions of special inquiries. There are about 700 to whom I address in a regular way.

The CHAIRMAN. How many States do you attempt to cover?

Mr. MURRAY. I only in a current way take some 10 to 12 States, which cover all the information we require in the work that we are pursuing in a general way. The Central States, Ohio, Indiana, Illinois, Iowa, Nebraska, Kansas, and frequently the Dakotas, Minnesota, Michigan, Missouri, Kentucky, and Tennessee. That is the region of our active inquiries.

The CHAIRMAN. And do you tabulate all that information yourself when you get it?

Mr. MURRAY. Yes, sir. I have been for many years accustomed to give personal and careful attention to such work.

I would like to say one word, if you will allow me, voluntarily, with reference to the proposition of pay for such information. I am strong in the conviction that the question of pay does not belong to the question of getting good information from agricultural districts.

I know that we have hundreds of correspondents who have been furnishing us information for many years, and by our ability to judge of the nature of their reports, and from the results that afterwards appeared, we have reason to think that they are honest and clean and clear reports, and that the information is furnished because these men have an interest in furnishing correct and accurate information from their localities; they are concerned in that, and they are public spirited and they furnish a class and nature and style of report that can not be secured by the man who works simply for the pay.

I am satisfied in my own mind that to put such work upon the pay basis would be to lower the quality of the result. I will submit the report of our committee of inquiry on agricultural statistics. We are very much obliged to you, gentlemen, for giving us this hearing.

The CHAIRMAN. The committee is much obliged to you.

(Thereupon the committee adjourned.)

REPORT OF COMMITTEE OF INQUIRY INTO METHODS OF THE CENSUS BUREAU AND OF THE DEPARTMENT OF AGRICULTURE.

[Investigation proceedings under action of the National Board of Trade, September, 1902.]

Hon. BLANCHARD RANDALL,
President National Board of Trade, Baltimore, Md.

DEAR SIR: The committee which entered upon the work of investigation concerning agricultural statistics, as a result of your invitation to various commercial exchanges to appoint representatives to act with the standing committee on crop reports of the National Board of Trade in such an effort, now reports the result of its work.

In accordance with arrangements previously made, the conference was begun in the office of Mr. L. G. Powers, chief statistician for agriculture of the Census Bureau, on Tuesday morning, September 16. There were present the following-named persons: Blanchard Randall, of Baltimore, president of the National Board of Trade; William S. Harvey, of Philadelphia, president of the board of trustees of the Philadelphia Commercial Museum; J. C. Brown, of New York, statistician of the New York Produce Exchange; B. Frank Howard, of Chicago, editor of the Chicago Daily Trade Bulletin, and representative of the Chicago Board of Trade; H. A. Wroth, of Baltimore, assistant secretary of the Baltimore Chamber of Commerce; William V. King, of New York, superintendent of the New York Cotton Exchange; Charles B. Murray, of Cincinnati, executive secretary of the Cincinnati Chamber of Commerce, chairman of the National Board of Trade committee on crop reports, and editor of the Cincinnati Price Current. Mr. Randall was obliged to be absent after the opening session of the committee, and Mr. King was called back to New York after the close of the first day. Thus the prosecution of the investigation subsequent to initial proceedings was confined to the remaining five members of the committee of inquiry.

PRELIMINARY PROCEEDINGS.

The members of the committee on assembling called Mr. Harvey to the chair temporarily, and later he was made permanent chairman. Mr. Brown was chosen to act as secretary.

The committee devoted nine days to investigation and deliberation concerning the work of the Census Office and of the Division of Statistics of the Department of Agriculture. It was realized at the outset that the opportunities for such inquiry into important questions were great, and far beyond the possible power of the committee to give to this work. Nevertheless there was the belief that sufficient information might be secured within the time at disposal to lead to conclusions helpful in explanations and understandings of causes of the differences in exhibits upon agricultural matters which called forth the effort undertaken, and possibly to accomplishment of something toward discovery of defects found to have existed in the work of the past, by which the further prosecution of such service by these branches of the Government may be guided in efforts for reaching a higher degree of accuracy and securing fuller confidence on the part of all interests concerned.

The chairman briefly reviewed the preliminary steps to this conference, and mentioned the general objects in view. He spoke of the effort as one seeking to discover where faults or defects may have existed in the gathering and preparation of agricultural information by the two branches of the Government, and if possible to suggest means by which erroneous methods may be remedied, in order that such official statements to be disseminated from time to time may have greater value and more reliability, there being no sentiment of antagonism concerning the offices to be investigated on the part of the earnest and sincere men who composed this committee. He called upon the chairman of the National Board of Trade committee on crop reports for a more complete statement as to reasons for the inquiry, saying that the meeting was open for suggestions from those present calculated to facilitate procedures for attaining the largest results and the fullest information possible in the short time to be devoted to this effort.

The chairman of the committee on crop reports in his statement referred to the fact that when agricultural statistics of the Census Bureau were made available to the public last spring they were in many particulars so decidedly at variance with prevailing expectations, based on other official data and unofficial investigation, that a sense of surprise was manifested, and the importance of questions involved led to much of comment suggestive of the need or desirability of an investigation which should support or discredit such exhibits. In recognition of this situation, and its relation to service to follow on presentation of such information, the matter was taken up by the president of the National Board of Trade.

A partial analysis of statements concerning leading crops, as illustrative of differences reached in the crop-reporting work of the Census Office and by the Department of Agriculture, furnishing occasion for consideration of causes of such results, was introduced as interesting and pertinent in this connection.

For wheat, taking the Department of Agriculture figures as the 100 basis, the acreage and yield per acre in the census report appear as follows for the States mentioned:

	Acreage.	Yield per acre.		Acreage.	Yield per acre.
California	112	97	Nebraska	12[illegible]	95
Idaho	187	82	New York	147	101
Illinois	144	108	North Dakota	110	105
Indiana	112	123	Ohio	114	110
Iowa	121	104	Oregon	76	94
Kentucky	159	109	South Dakota	112	98
Minnesota	129	108	Tennessee	150	95
Missouri	179	113	Entire country	118	102

For corn similar comparisons are shown in the following:

	Acreage.	Yield per acre.		Acreage.	Yield per acre.
Colorado	49	88	Nebraska	91	103
Illinois	149	108	New York	131	97
Indiana	120	105	North Carolina	111	100
Iowa	125	126	Ohio	139	111
Kansas	94	96	Oklahoma	248	152
Kentucky	126	105	Pennsylvania	118	109
Michigan	152	100	Wisconsin	126	100
Missouri	118	107	Entire country	115	110

For oats similar comparisons appear in the following:

	Acreage.	Yield per acre.		Acreage	Yield per acre.
California	259	104	Nebraska	112	100
Georgia	67	109	North Dakota	130	94
Idaho	200	90	Ohio	122	105
Illinois	136	104	Oregon	153	86
Iowa	122	109	South Dakota	117	97
Kansas	67	94	Tennessee	62	82
Kentucky	69	70	Washington	155	114
Minnesota	134	105	Wisconsin	125	95
Missouri	113	90	Entire country	112	105

These comparisons reflect wide differences, not only in the acreage basis, but also in the average yield per acre for wheat, corn, and oats.

Naturally the differences in yield per acre are less striking than those of area, but in this feature there are many instances of variation to a degree which should not be expected. For instance, Indiana shows 23 per cent larger yield per acre for wheat, Missouri 13 per cent larger yield, Ohio 10 per cent larger yield, Idaho 18 per cent smaller yield, etc., for census returns in comparison with the Department information, while the general average for the entire country, through the balancing results of differences, is but 2 per cent larger for this crop.

For corn, the important State of Iowa shows 26 per cent larger yield per acre, Ohio 11 per cent, Illinois 8 per cent, Oklahoma 52 per cent, and the entire country an average of 10 per cent excess in comparison with the Department data.

For oats, Iowa shows 9 per cent larger yield per acre, Minnesota 5 per cent, Ohio 5 per cent, Washington 14 per cent, while Kentucky reflects 30 per cent smaller average, Tennessee 18 per cent smaller, Oregon 14 per cent smaller, Idaho 10 per cent smaller, and the entire country 5 per cent larger average yield per acre, in the comparison with Department information.

Taking up the area exhibits, the differences are great in many instances. In the comparison with Department returns for wheat the census averages show increases of 87 per cent for Idaho, 44 per cent for Illinois, 21 per cent for Iowa, 59 per cent for Kentucky, 29 per cent for Minnesota, 79 per cent for Missouri, 26 per cent for Nebraska, 50 per cent for Tennessee, etc.; and for Oregon a decrease of 24 per cent, for Wisconsin a decrease of 27 per cent, and for the entire country an increase of 18 per cent.

The area comparisons for corn likewise shows great differences, representing 49 per cent for Illinois, 20 per cent for Indiana, 25 per cent for Iowa, 26 per cent for Kentucky, 52 per cent for Michigan, 39 per cent for Ohio, 148 per cent for Oklahoma, etc., as excesses of census acreage compared with the Department reports, there being a decrease of 6 per cent for Kansas, 9 per cent for Nebraska, 51 per cent for Colorado, etc., the entire country indicating 15 per cent larger area.

For oats the area comparisons are even more striking in a general way, the higher exhibits of the census showing for California 159 per cent larger acreage, Idaho 100 per cent larger, Illinois 36 per cent, Iowa 22 per cent, Minnesota 34 per cent, North Dakota 30 per cent, Ohio 22 per cent, Oregon 53 per cent, Washington 55 per cent, Wisconsin 25 per cent, etc.; the smaller areas including a decrease of 33 per cent for Georgia, 33 per cent for Kansas, 31 per cent for Kentucky, 38 per cent for Tennessee, etc., and the entire country an increase of 12 per cent for census area of oats compared with Department reports.

Turning now to the comparative quantity of grain we find the following in regard to wheat for States mentioned, showing by percentage the census indication, as compared with 100 for Department of Agriculture figures:

Idaho	155	New Mexico	23
Illinois	156	New York	148
Indiana	138	North Dakota	116
Iowa	125	Ohio	126
Kansas	106	Oregon	66
Kentucky	174	South Dakota	111
Michigan	154	Tennessee	144
Minnesota	139	Texas	135
Missouri	202	Entire country	120
Nebraska	120		

For corn similar comparisons are as follows:

Illinois	161	Nebraska	94
Indiana	126	New York	128
Iowa	158	Ohio	153
Kansas	97	Oklahoma	378
Kentucky	133	Pennsylvania	129
Michigan	168	Texas	135
Minnesota	151	Wisconsin	128
Missouri	127	Entire country	128

Following up these comparisons we have the following for oats:

Illinois	142	North Dakota	125
Iowa	133	Ohio	128
Kansas	62	Oregon	131
Kentucky	49	South Dakota	127
Michigan	118	Texas	142
Minnesota	140	Washington	176
Nebraska	112	Wisconsin	126
New York	90	Entire country	118

It is interesting to make comparisons with some of the State official reports, which are understood to represent results reached independently of the Department of Agriculture data from year to year. For Kansas, taking the State report as 100, the census comparison for wheat in product is 89, for corn 102, for oats 94, for barley 44, for potatoes 105. For Iowa the comparison represents 115 for wheat, 125 for corn, 113 for oats, 123 for barley, 113 for potatoes. For Illinois wheat is 179, oats 112, barley 145. For Ohio wheat represents 121, corn 137, oats 126, barley 140, rye 138—and for these 5 grains, 131.

These data furnish an indication as to the ground for inquiry into the results reached and methods pursued by the Government service in its work pertaining to agricultural statistics. Similar comparisons, and of equally striking nature, could be much extended, including such crops as hay, potatoes, cotton, etc., and as to numbers of live stock in the country.

CENSUS BUREAU INQUIRY.

The committee proceeded to take up questions with the chief statistician for agriculture of the Census Bureau, who manifested great readiness to facilitate the work undertaken by displaying returns from enumerators, showing the machines used for punching cards for the purpose of accomplishing mechanical registration by the tabulating machines, which were also exhibited in operation, with full explanations concerning these features of the work; the methods pursued for correction of incomplete or defective returns, and, in fact, each step from the work of the enumerator and the supervisor to the final consolidation of totals, covering the several distinctive lines of data collected by the Census Bureau relating to agricultural affairs.

The schedule for agricultural information was far more complex in its comprehensiveness than in any previous census, and necessarily more difficult of full understanding by those who made returns, as well as by the enumerators, thus increasing the chances for incomplete or erroneous reports. It embodied questions concerning an enlarged scope of information called for under the greater interest in agricultural affairs in their relations to various economic problems, in addition to the usual facts relating to areas, production, and values.

In collating the information from the large list of items in the schedules there were found omissions and inconsistencies which called for very extensive supplementary inquiry, as well as for much editing of the returns.

It is claimed by the statistician that the greater proportion of errors in the census work was in the returns from the enumerators. The arrangements for schools for instruction of enumerators were exceptional, and had they been more general a greater degree of accuracy in the schedule returns would have been assured. Fuller recognition of qualification, and a course of training, would have obviated a large proportion of the defective work of the enumerators.

There were 43,000 enumerators who collected census agricultural statistics, and 300 supervisors. The statistician stated that in the work of revising the schedules received from the enumerators there were 199 out of every 200 entries passed as substantially correct, or one-half of 1 per cent not so passed. This, however, is not accepted by the committee as evidence that such percentage represents the extent of actual errors in such entries. The proportion of bad schedules was stated as 1 in 300 in the North, and 1 in 100 in the South. Upon this basis it was assumed by the statistician that the effect of errors upon results did not exceed from one-half to 1 per cent.

In the editing of schedules for the correction of errors and inconsistencies, it was claimed that for the cereal crops one-tenth to one-fifth of 1 per cent of the returns for wheat and oats called for such work, while 30 per cent of the returns for corn required such revision—the larger percentage of this grain being due to confusion in statements representing ear and shelled corn. The element of value of product being one of the features of the report served as a guide in harmonizing results in many instances.

It was claimed that the errors in the punching-machine work not detected represented a fraction of 1 per cent, and that these, combined with the errors of the tabulating-machine work, represented about one-third of 1 per cent. How such a conclusion was or could be reached was not explained, and in view of the reported record of tests of card-punching work during five months in 1901, showing 1.34

per cent of cards incorrectly punched or omitted, or 1 in 75, these statements can be reconciled only on the presumption that these tests related to the work of the less experienced or poorest clerks, whose work called for particular or continuous examination, and that a large part of the work represented a decidedly lower percentage of errors. The ratio of errors found in the tests of card punching, 1.34 per cent, applied to the 120,000,000 cards, would imply that 1,608,000 were erroneous.

There were 5,739,655 schedules or reports from enumerators, representing this number of farms, of which 53,406 reported no crops. In the tabulating work there were two forms of cards used, which were punched for registration by the tabulating machine. One form was known as the farm card, representing ten subjects. The other was the crop card, giving the State, county, color or race of person conducting the farm, tenure of farm operation, size of farm, source of income, kind of crops, acres, quantity of product or number of animals, and value of products or of animals. There were over one hundred kinds and classes of products and animals recognized on the schedules. The number of crop cards was about 115,000,000, and including the farm cards the total was about 120,000,000.

From the schedules of enumerators to the punched cards and the registering work of the tabulating machines, including the incidental work in editing, etc., it was manifest that in each of the various steps there were chances for and evidences of errors. The important question was as to the probable extent of such errors in influence on the general results. It was evident that much effort was made to secure correction of errors, but whether to as full an extent as should be expected in such an intricate work the committee can not state.

An exhibit of the crop cards verified in the Census Office work during the five months of February to June, inclusive, 1901, and classification of errors found, with percentage of error of each of the fourteen classes and for those unclassified, furnished the following data and results: Number of cards verified, 1,230,727; errors found, 16,500; percentage of cards found erroneous, 1.34; average percentages of errors by classes—wrong designation, 7.33 per cent; not increasing ten's digit when omitting major unit, 2.02; increasing ten's digit when omitting minor unit, 0.88; error in two figures, 0.16; wrong symbol, 19.34; omitting cards, 25.89; duplicating cards, 2.84; reading wrong line, 1.21; transposing figures, 0.41; wrongly read, 17.15; misspaced, 5.39; digit not cut off, 4.42; digit cut off in error, 2.85; two punches in one column, 2.53; other errors unclassified, 7.58.

This exhibit implies that for 10,000 cards there were found 134 cards erroneous from operations of punching, of which 35 were from omission of card reports, 26 from using wrong symbols, 23 from wrongly reading, 10 from wrong designation, and 40 from all other sources of error. This proportion of erroneous cards is 1 in 75.

The accuracy of general results in this statistical work being so largely dependent upon accuracy in the punching of cards for the tabulating machine, it is appropriate to particularize as to methods pursued to test the correctness of the work so performed. The punching operators were women. It was explained that when a new clerk was assigned to this work she was placed on experimental work for some length of time, to become familiar with the symbols and the machine. The work was then occasionally examined and verified by the chief of the section, but no record of errors was kept. As soon as in his opinion the stage of proficiency had been reached to justify it, the operator was assigned to regular work, as a substitute, taking the place of one who happened to be absent on leave. This was regular work, and every card of such operator was verified until the percentage of error was reduced to one-half of 1 per cent, which means that there was on an average not more than one error to each 200 cards. When this point of proficiency was reached the clerk was given a permanent place whenever a vacancy occurred, and after that only about one-fifth of the daily work was examined, provided the error record for the month did not exceed one-half of 1 per cent.

It was claimed by the statistician that the possibility of error in the crop-reporting work was much less than the number of schedules, and that by taking the returns of any county it would be shown that the average enumerator gave a reasonable report—a few being too large, and a few too small, with an average reflecting general accuracy of the reports. This presentation is regarded by the committee as implying a higher degree of merit than a careful and specific analysis of the returns will fully justify.

In the preparation of cards by punching there were symbols used to represent designations as to classes of returns, these symbols being composed of figures—as, for instance, 211 represented cotton reported in square bales, 212 cotton in round bales, 215 cotton seed in bushels, 216 cotton seed in tons, etc. Cards were sorted by such symbols, as to crops and kinds of product, for the work of the tabulating machine, which registers in accordance with the punched openings in the cards, admitting of circuit connections of electrical wires acting on the registration mechanism. The entire number of symbols used was about 300, the operator being obliged to memorize a large proportion of them, used in relation to prominent crops, while those of less frequency of use could be referred to on the sheet before the operator.

While the tabulating machines were liable to get out of order, thereby rendering imperfect work, it was claimed that such disorder was soon detected by the operator, and that tests of machines twice daily obviated any important degree of erroneous results—the work being done over from the point of discovery of disorder back to the point of previous test. The more common error was on the part of the operator, including failure to correctly change the machine switches as occasion called for such changes.

Registrations on the tabulating machines were copied on result sheets, and from these the records passed to consolidation sheets, upon which the totals were reached, and in each step of this progressive work there was some margin for error.

In a comparison of tabulating work by machine and by hand the statistician submitted results for 57 counties in Illinois for corn, indicating that the machine tabulations reflected a loss of one-half of 1 per cent in acreage and one-fourth of 1 per cent in bushels. For the State of Missouri the tabulation of the wheat crop indicated that there was a loss of four-tenths of 1 per cent in number of farms, five-tenths of 1 per cent in acres, three-tenths of 1 per cent in values, and a gain of one-third of 1 per cent in bushels by the machine compared with hand work. For the Idaho wheat crop there was a gain of nine-tenths of 1 per cent in acres, one-tenth of 1 per cent in bushels, and three-tenths of 1 per cent in values by the machine in comparison with hand work. For 3 counties in Kentucky and 6 counties in North Carolina comparisons of tabulations of the tobacco crop had been made, resulting in a gain of two-tenths of 1 per cent in acres and a loss of five-tenths of 1 per cent in pounds by the machine in comparison with hand work.

In regard to the cotton crop the Census Bureau made investigations through the division of agriculture and also the division of manufactures—the former representing returns from the farmers and the latter from ginners. There were some differences, of varying importance, in the results, which were partly harmonized by later investigations by the division of agriculture. The final exhibits make the farm report show 111,267 bales less than indicated by the manufactures report, which was explained as in part or largely due to the fact that ginners reported the number of commercial bales regardless of the differences of weights of round and square bales, while the farm report in some instances counted two round bales as the equivalent of one square bale. On the basis of weight the farm report is 0.95 per cent in excess of the ginners' exhibit, and in comparison with the report of the Statistical Division of the Department of Agriculture for the same crop the excess is 2.4 per cent.

Features of inconsistency in the Census Bureau work are to be found in comparisons of area, in instances where the agricultural returns make the farm areas equal to or exceed the land surface, according to survey records as presented by the Twelfth Census. There appear many such instances. In 20 States, in which there are 1,490 counties, there are 101 counties made to appear as having farm lands equal to or in excess of the entire surveyed land surface. This number includes a few which by a small fraction of 1 per cent are under 100 in the comparison, but which practically represent the entire land surface. The excesses over an equal extent of area range up to 40 per cent, the aggregate number of acres indicated in the farm returns of these 101 counties being 5 per cent greater than their entire surface, without allowances for highways, towns, railroads, etc. Of the 101 counties there are 69 which appear to have more farm acres than the surveyed land records indicate within their boundary lines; there are 23 having over 5 per cent excess of such area; there are 13 having over 10 per cent of such excess; 10 having over 15 per cent of such excess; 8 having over 20 per cent of excess, in comparison with the reported actual land surface. For Ohio, 19 per cent of the number of counties are shown to represent 100 per cent or more of the entire surface as in farm lands; in Iowa, 17 per cent; Kansas, 12 per cent; Kentucky, 9 per cent; Missouri, 9 per cent; Tennessee, 6 per cent; Indiana, 6 per cent, etc.

In addition to these 101 counties found by analysis of Census Bureau data to reflect returns of farm lands equal to or in excess of the surveyed land surface of such counties, there are 700 other counties showing 90 per cent or more, of which 335 represent 95 per cent or more, in such comparison. Thus over 28 per cent of all the 2,800 counties of the country represent farm areas reported as 90 per cent or more of the surveyed land surface.

Whether these conditions, reflecting a large extent of farm acreage in excess of what can be accepted as the true position, are due to overestimates in returns of enumerators, or to duplications in the mechanical operations incident to the methods of the Census Office in the tabulating work, or to both of these, with inconsistent work in editing the schedules, and other causes, can not be stated by the committee, but they are evidences of erroneous work, the measure of which in influence on results can not be satisfactorily estimated.

While there are the large number of instances of inconsistencies and excesses in the comparisons of farm returns of area and survey records herein mentioned and demonstrable by the available data, it does not follow that all the census exhibits of farm areas not having such evidences of inconsistency are free from errors or exaggerations in the statements of farm areas. For instance, a county which may have only 60 per cent of its area actually in farm lands may be exaggerated 50 per cent and not appear to be over 90 per cent in the comparison with the land surface of such county. Again, a county which may have only 45 per cent of its area in farm lands may be doubled in the crop exhibit without going over the 90 per cent relation to actual land area. It is therefore impossible to determine or to suggest the limit to which such exaggerations or errors may exist in portions of the work wherein the conditions do not admit of such demonstration as in such cases as are herein specifically stated. Exaggerations or errors which enlarge the area basis correspondingly affect unduly the results in regard to production of crops represented.

As a result of investigations and deliberations in regard to the work of the Division of Agriculture of the Census Bureau, the committee has reached the following conclusions:

1. The preparation of the census schedule relating to agricultural data was unavoidably complex, under the demand for information upon a wide range and various divisions of subjects.

2. The schedule was evidently formulated by the best judgment available, representing a high degree of intelligence on the part of its constructors in regard to questions involved and of requirements of the situation.

3. The executive direction of the statistical work appears to have been in charge of persons of high order of competency, while the operatives and those in supervision of their work by sections were not selected and retained through tests of qualification under the system by which such persons were appointed to service. The executive officials were without power to dismiss unsatisfactory operatives, but they were enabled to transfer persons from work to which they were found to be not competent or not adapted to other work more suitable to their qualifications. Thus, it was held by the statistician that the political relation to the selection of the great number of operatives had little or no appreciable influence unfavorably affecting statistical results.

4. The basis for errors in the census agricultural statistics included inability or failure on the part of farmers in many instances to accurately state or report the information called for; incompetency of enumerators in their ability to make accurate and full records on the schedules; lack of needful knowledge on the part of supervisors to enable them to discover all defectiveness in the schedules—these factors representing the prominent primary elements or grounds for error.

5. The work of collating and tabulating the information reported on the schedules was attended with opportunities for error in editing the schedules for guidance of card punching; in editing to correct evident mistakes, deficiencies, or inconsistencies in schedule records; in the work of punching the cards used for registration; in disordered condition of tabulating machines; in careless work of operators of tabulating machines, including duplication or repetition of registrations; in copying totals from the machine dials to result sheets and to consolidation sheets, and in the work of totalizing.

6. In carrying out the work of collating and tabulating such information no certainty of strict accuracy of results can be had otherwise than by duplicating operations and comparisons, following the lines of differences until like results have been reached.

7. It has not been possible for the committee to determine the extent to which errors in the returns and in the various processes of the statistical work have affected the results reached or have furnished occasion for regarding the general conclusions as undeserving of confidence as being within reasonable approach to accuracy, or as essentially less accurate than should be expected from the application of best-known methods for accomplishment of work of such magnitude and comprehensiveness within the time imposed by Congress for its completion.

8. The causes for the surprises and elements of doubt which have arisen on the part of interested observers in regard to the census agricultural statistics have not been altogether attributable to imperfect or erroneous work in this branch of governmental service, but largely to comparisons made with other official exhibits, governmental and State, constructed on lines more or less seriously faulty, and which have led to results at corresponding variance with accuracy.

The committee regards it important that in the future work of. the Census Bureau the various defects found in the methods pursued in the Twelfth Census in the collection and presentation of agricultural statistics should be remedied. These features include the following:

1. In all the more important districts the supervisors should institute schools for instruction of enumerators, to the end that the fullest possible understanding shall be had of the requirements for correct records on the schedules, thus securing a higher degree of accuracy in the primary basis for such statistics.

2. In the editing of schedules greater care should be had in having the clerk well qualified by fitness and training for such work, for in this feature is one of the most significant of possibilities for harmful shaping of the results, and therefore one of the greatest of needs for careful and intelligent scrutiny and preparation of this record as a basis for compiling and tabulating operations.

3. The verification of cards prepared for the tabulating machines, including the mechanical tests for cards, should be accomplished before instead of after the machine tabulation, and a larger proportion than heretofore or all the cards should be verified by the schedules.

4. The more important crop data should be tabulated in duplicate, to prove the accuracy of the work.

The committee recognizes the achievement of the Census Bureau in completing its work within a period of two years as a matter of great importance relative to the value of such information, and regards with satisfaction the assurance of the chief statistician for agriculture that the experiences had in the Twelfth Census work give encouragement to the expectation that improved methods can be introduced at the next census making it possible to reach conclusions within a period of eight months, and that the progress of operations of the past census has been educational to an extent insuring great improvement in features of accuracy of such future statistical work.

In view of the advantages to be expected from the Census Bureau being placed on a permanent basis and of the promise of a shortened period for presentation of results, the committee favors a census report every five years, especially for agricultural data which form a basis for calculations and estimates of area and production by other official service, governmental and otherwise, as to the more prominent crops and as to numbers of farm animals.

DEPARTMENT OF AGRICULTURE.

In the several sessions of the committee at the Department of Agriculture there was found most satisfactory readiness to furnish any information and explanations called for, and to aid the members of the committee in reaching a complete understanding of the methods pursued in the statistical division.

The present Statistician entered upon his duties on August 1, 1897. The sources of information which form the basis of the crop reports of the Department include, first, returns from county correspondents in each of the grain-producing counties of the United States, who report directly to the Statistician, these county representatives having their own lists of correspondents or assistants. Second, township correspondents, who report direct to the Statistician upon conditions in their special regions, which returns are collated by the Department service. The county and township returns are compiled separately, in different sections of the division, as a check upon each other. Third, State agents, having correspondents who report direct to them, such agents transmitting to the Statistician the general results thus obtained for their States. These three classes represent sets of correspondents entirely independent of each other. While these are the main sources of crop information in specific form, there is a fourth element of aid, through the service of special field agents, whose province is to make personal inquiry, and especially at times and in localities which invite such collateral investigation because of unusual or abnormal conditions found to have existence. The adoption of the system of township correspondents was upon the recommendation of a conference on crop-reporting matters held at Washington in April, 1895, growing out of action by the National Board of Trade. The system of special field agents was established under recommendation of the present statistician, who also inaugurated a list of cotton ginners to facilitate gathering of cotton data.

The number of county correspondents of the Department of Agriculture reporting on crop matters is about 2,500, the total number of counties being 2,800. The number of township correspondents is approximately 30,000. The number of State agents at the present time is 38, and of special field agents is 6. There are also 7 special cotton agents, and a special foreign agent, with headquarters at London. The State agents receive pay ranging from $300 to $800 per annum, special cotton agents $240 to $600 per annum, and special field agents $5 to $7 per day and traveling expenses. No money remuneration is received by county and township correspondents, but seeds, bulbs, and agricultural literature are furnished them. The number of direct returns received by the Department from month to month during the crop-reporting season is approximately 25,000. The Department crop correspondents are said to be 85 to 90 per cent farmers.

The Department reports of area from year to year are based upon percentage estimates, 100 representing the understood position of the preceding year. These estimates have had as a reconstructed or starting basis the latest census returns, from which the results have been calculated during the period between the dates of such information being available. It is understood, however, that modifications have been made from time to time in the light of evidence that such results have diverged in important degree from the true position. The early statements yearly of such crop areas as represent grain include comparisons recognizing 100 as the seeding of the preceding autumn and of the preceding spring, the final report as the harvested area being modified by any estimates of changes due to abandonment or loss of crops, etc. Thus the harvested area is presented as in comparison with the understood harvested area of the preceding year.

The reports on condition of crops in their growing and maturing period are based on the percentage system, 100 representing, as officially stated, "a condition of perfect healthfulness, unimpaired by drought, hail, insects, or other injurious agency, and with such growth and development as may reasonably be looked for under these favorable conditions.

In the consolidation of returns of condition and yield per acre full recognition is given to the relative area basis by counties in each particular, thus securing a true average.

The Statistician makes a comparison between the results of the computations of his office from reports from township and from county correspondents and from State and special field agents, and when any material differences appear he endeavors to reconcile them by examination as far as practicable into the reasons for such variations. If they are in close agreement he accepts them as a basis for his estimate.

These particulars indicate in a general way the methods of the Department of Agriculture in the crop-reporting work of the statistical division. They do not, however, represent all the elements which may have an influence upon the reliability of results reached and disseminated. Among the other factors which may be thus recognized are a possibly faulty area basis as a starting point, accepted from the latest census returns; a tendency to underestimate on the part of correspondents in application of percentage comparisons; and a cumulative divergence from the true line by progressive application of such underestimates. Other factors of such nature include the qualifications of the service engaged in collating the information and formulating conclusions. Even though the head of the statistical division be competent and devoted in efforts for thoroughly worthy and reliable statements reflecting the work of his office, he may be powerless to fully control the service under him with reference to fitness and efficiency, so that in more or less degree he may be unable to remedy conditions having a prejudicial influence upon statistical results.

At the time the present Statistician took charge of the office, in 1897, there was a widely and, in fact, generally prevailing belief that the Department crop statistics were seriously faulty. The new appointee had in his favor an experience in the division of agricultural statistics in the Eleventh Census and otherwise, which supported a claim for confidence in his fitness for the position. In the nature of the situation, however, he has not had needful power for reconstruction of service under him. Nevertheless, with all that he has had to contend with, great improvement has been reached under his administration in elevating the character and increasing the reliability of the data furnished to the public, for which the committee regards him as entitled to high commendation, especially under the evidences that the chief causes for defective results in his work have been in large degree attributable to conditions inherited, and which in the nature of the organization of the office could not be at once remedied, or were beyond his control.

A feature of past and present conditions of an unfavorable nature connected with this service is the large proportion of aged and inefficient persons brought into and retained in this working force. The average age of the 69 persons thus engaged is 48 years—one-half being 50 years of age and older, representing 23 persons ranging from 50 to

59 years of age; 7 from 60 to 69 years; and 4 from 70 to 76 years. So far as known, no other branch of the governmental service is correspondingly embarrassed. The responsibility for this unfavorable condition in the Division of Statistics does not belong to the head of the division.

One of the impediments to better results attending the crop reporting service of the Department of Agriculture lies in the retention of this work in a division, while its importance calls for the stronger elements accorded to a bureau.

Without wishing to depreciate in any way the value of other branches of the Department of Agriculture work, or to call into question the merit of appropriations made for them, the committee is of the opinion that the value to the entire country of the Statistical Division as compared with others is not reflected in the relative amounts of appropriations thus made. For instance, the Bureau of Chemistry this year had an appropriation of $73,700; the Bureau of Soils, $169,680; the Bureau of Forestry, $291,860; while the Statistical Division had $141,160, of which $88,000 represents salaries in Washington, mainly incident to tabulation of crop information.

In the nature of questions particularly inviting the attention of the committee those relating to cereal crops were especially prominent, but considerable consideration was given to cotton, including the methods pursued in securing and collating information relating to this product, and there was found reason for believing the Department service now to be pursuing commendable methods for determining the situation as to condition and yield of cotton, the Statistician manifesting a feeling of confidence in being able to reach and to maintain satisfactory results in such particulars.

That there is an element of weakness in the percentage system as applied to quantitative estimates can not be disputed, for the evidence is conclusive that such estimates almost invariably have a tendency to understatements. This has been illustrated in various ways, and is reflected in the testimony of the Statistician, who stated that if the figures of correspondents in regard to cotton acreage were taken and applied as received, expressed in a percentage comparison from year to year, the calculations would result in apparent loss of nearly all the area at the end of a period of ten years. But this fact and observation do not make the system valueless, for with these conditions being known and intelligent allowances made, results sufficiently accurate can be had to serve as a basis for deductions and comparisons.

Heretofore it has been difficult for the Department to secure reliable data in regard to extent of tobacco production, but the Statistician is now at work on a plan which he expects will enable the Department to present very complete and accurate information in regard to this product.

From investigations and deliberations in regard to the work of the Statistical Division of the Department of Agriculture the committee has reached the following deductions and conclusions:

1. The errors in crop statistics of the Department of Agriculture appear to have been due more to a faulty area basis than to any other cause.

2. The present Statistician appears to have earnestly endeavored to secure correction of the errors in the area basis of crops, but as late as 1901 he had manifestly not fully overcome the deficiencies in this particular which existed when he entered upon the work of his office. The stated proportions of a crop when based on percentage calculations are a misrepresentation to such extent as the area basis is erroneous.

3. In readjusting the area basis during the current year the Statistician has accepted the Census Bureau returns, with some exceptions wherein there was deemed ground for modification in the light of other evidence.

4. The Statistical Division is more or less embarrassed, and seemingly to an important degree, by the manner in which the working force of the office is organized under political influences, making it impracticable for the Statistician to reconstruct the service on a basis of qualification and efficiency.

5. While the percentage system used by the Department of Agriculture can not be depended upon for the fullest degree of accuracy of reported results, it is undoubtedly the best practicable system available for purposes of monthly and yearly reports. It needs to be applied with an intelligent understanding of its true meaning and significance.

With reference to the future operations of the Statistical Division of the Department of Agriculture the committee submits the following propositions and recommendations:

1. The work of the Statistical Division is of such importance to the agricultural interests of our country, and to commercial affairs in the transactions of tradesmen in this and other countries, that the committee is impelled to urge the honorable Secretary of Agriculture to give his favorable consideration to the need of securing for this branch of governmental service the strength and power of a bureau, at the earliest date practicable, with an increased appropriation if necessary, and that he lend his full influence for attainment of this end.

2. The working force under the Statistician, including State agents, should be thoroughly reorganized on a sound business basis, recognizing qualification and giving certainty of efficiency in such service.

3. The Committee unqualifiedly declares it inadvisable to entertain any plan for transfer of the work of the Statistical Division to any other branch of the Government service, regarding it of great importance that it should have and should maintain distinctive powers.

4. In the crop reporting work, the important aid which has been secured through the service of special field agents supports the view that there should be an increase in such service, to the extent of 12 or 15 persons as a total number, with a chief in general charge, having direction of such branch of service.

5. In addition to the present method of inquiry as to comparative crop area on a percentage estimate, it is recommended that the Statistician also provide in the schedules an inquiry for acreage estimates, for the important crops, requesting the correspondents to invariably furnish this information, which will serve as an important guide in reaching conclusions.

6. The method of reporting winter wheat and spring wheat conditions separately a portion of the season and subsequently as consolidated should be so changed that such exhibits shall be given separately and consolidatedly to the end of the season.

7. In statements of condition and yield of wheat, it is recommended that in specifications of winter and spring grain distinctively the reports recognize areas by States, making the classification in accordance with the predominating characteristics in this particular.

8. The yearly final report of the leading crops by States, giving acreage harvested and production, should be accompanied by a statement indicating the differences between acreage planted and acreage harvested, where there are notable differences.

9. In reporting the estimated areas of crops planted or seeded, the

Statistician should definitely state the acreage figures as well as percentage comparisons.

The committee in this report has endeavored to describe the methods ascertained to have been pursued in the governmental work relating to agricultural statistics, and to point out as far as discoverable and practicable to particularize the more apparent elements of a faulty nature in the work that has been performed, and their causes, as well as to recognize the evidences or improvement that may be expected in the future work as a result of experiences acquired in the past, and also to suggest in some particulars what in the judgment of the committee may be favorably considered in the shaping of such official work in the future.

In concluding this report the committee has pleasure and great satisfaction in noting the spirit manifested on the part of the officials of the Government in facilitating the work undertaken by it, including heads of departments, bureaus, and divisions, and other service in which it was brought in contact. There was complete readiness to help the committee, and an absence of any disposition to hinder or obstruct its work or to withhold any information called for. And it is also appropriate to say that there has been the highest degree of harmony and accord in the proceedings of the committee in its efforts to solve the difficult problems delegated to it for investigation and consideration.

The committee found abundant and assuring evidences of recognition on the part of executive officials of the deficiencies of the past and of the value of their lessons influential for betterment of results in future work, as also a disposition to welcome and to give due consideration to any suggestions helpful in such direction which might be offered as a result of investigations and deliberations on the part of the committee. The Census Bureau in being placed upon a permanent basis has been strengthened in its ability to conduct its work with a higher degree of efficiency and reliability than heretofore, as well as having the advantage of experiences incident to the broadened scope of its work in the past census. The Department of Agriculture has given important recognition to the evidences of faulty features in its crop reporting work, and is earnestly endeavoring to remedy all such defects. In view of the various bearings upon agricultural statistics of the future of an encouraging nature, there appears to be much upon which to base expectations of important improvement, and removal of a great part of the causes responsible for erroneous results in the past, and of disturbance of confidence in such exhibits.

With the closing of this investigation and submission of this report the committee does not regard its work ended, for it recognizes a duty to maintain efforts for securing the ends favored, and adoption of the measures recommended in this report.

Respectfully submitted.

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